WESTERN GAS

March
1929

Work starts at Tres Pinos on P. G. and E.'s giant gas carrier, to bring San Joaquin Valley natural gas to northern Californian communities.

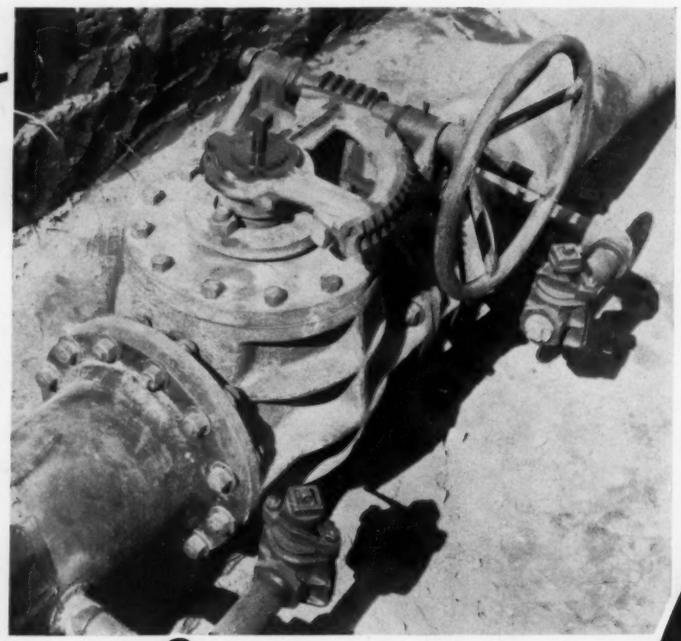
20 Cents
the Copy

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

NORDSTROM VALVES

MERCO

REG. U.S. PAT. OFF.



Nordstrom geared valve, 150 lb. flanged, with worm gear operating mechanism.

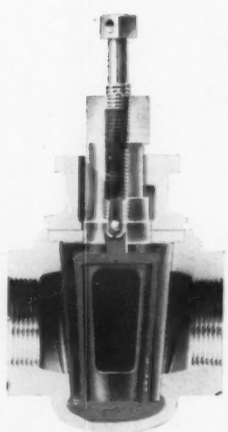
Lubricated

will not let liquids and gases creep around the plug

For the Gas Industry

Nordstrom Valves are widely used in the Gas Industry for handling high pressure gas under all conditions, particularly in its distribution systems. Among these uses are—compressor stations, regulator pits, ammonia spray and acid lines, dilute sulphuric acid, steam and air lines and as hydraulic valves to operate stack dampers on gas machines.

When used in regulator pits, the Nordstrom Valves, compact design provides a substantial saving in construction costs because the pits can be made smaller.



THE patented lubricating principle of Nordstrom Valves produces a positive seal between the contact surfaces of the plug and its seat and surrounding body, making the valve tight against leaks. . . A tight valve is assured because the valve is never separated from its seat sufficiently to allow the entry of foreign matter.

Sticking is quickly and easily remedied by a few turns of the lubricant screw. This simple operation exerts an upward pressure on the tapered plug that releases it instantly, should it ever become stuck.

"Merco" Lubricants

"Merco" Lubricants play an important part in the application of Nordstrom Valves to various services in the Gas Industry. The lubricants are made of special materials to efficiently handle various conditions of temperature, solubility, pressure or chemical attack and are obtainable in many different types.

Your Copy of Catalog No. 6 is ready for you. Ask for it today!

Merco Nordstrom Valve Company

Subsidiary of The Merrill Company

Engineers . . . Manufacturers

NEW YORK - 11 W. 42nd St.
BOSTON - 184 Boylston St.
PITTSBURGH - Clark Bldg.
BUFFALO - Genesee Bldg.
DETROIT - 2842 W. Grand Blvd.
CHICAGO - 176 W. Adams St.
NEW ORLEANS - Masonic Temple Bldg.
HOUSTON - Petroleum Bldg.
DALLAS - Magnolia Building
LOS ANGELES - 556 S. San Pedro St.
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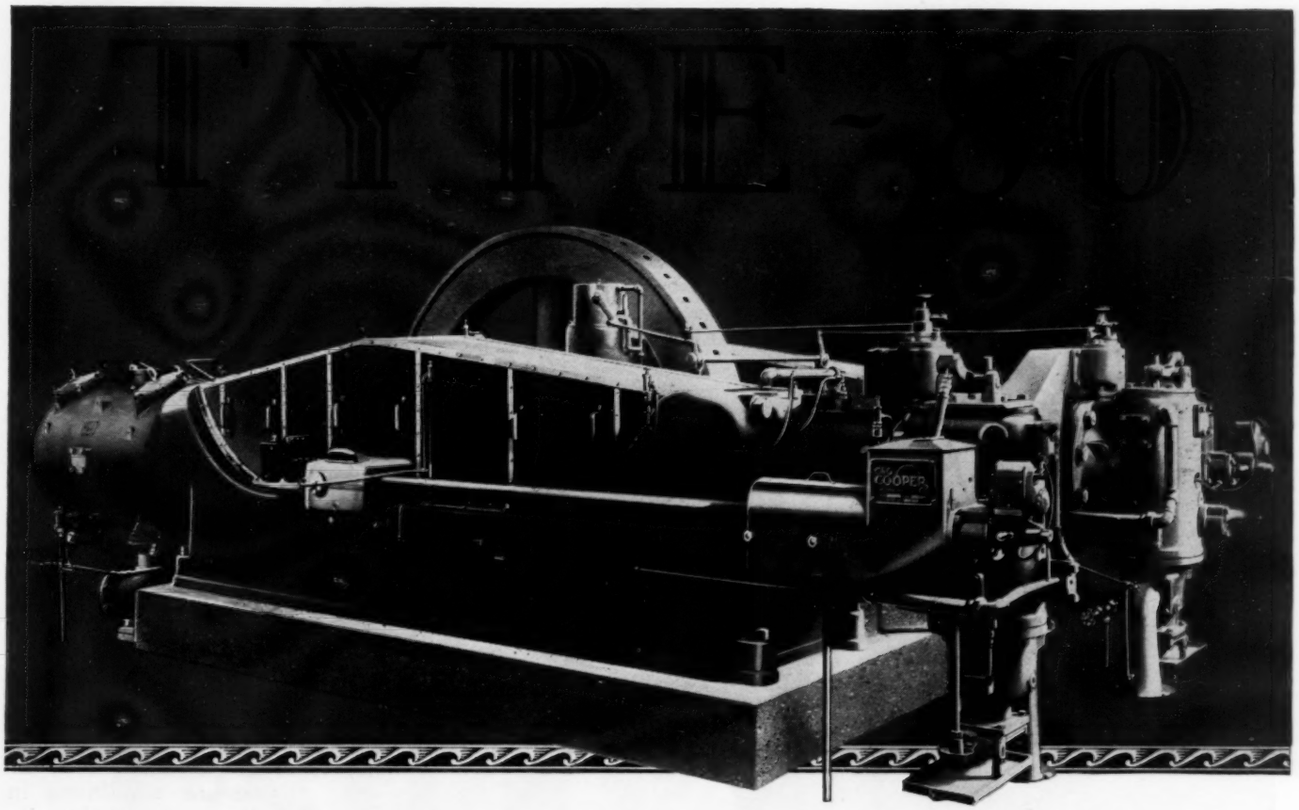
Canadian Manufacturers - PEACOCK BROS., Ltd., Montreal, Que., Cobalt, Ont., Winnipeg, Man., Vancouver, B.C.

FACTORIES: Oakland, California and Belleville, New Jersey



The 1929 Cooper Type 80 is a still better gas engine

Every year the Cooper Type-80 170 H.P. gas engine driven compressor has been improved. A number of refinements in both design and materials have been added which make it a still better value for 1929.

It will always be a four-cycle single-acting engine—simple to install and operate. Compared on the basis of fuel economy, lubricating oil consumption, installation cost, maintenance cost, percentage of hours on the load, and earning capacity, there is nothing to equal it for the service which it meets.

General managers, stockholders, superintendents, operators —no one of them ever regrets his choice of a "Cooper."

The C. & G. Cooper Co., Mt. Vernon, Ohio

1116 Magnolia Bldg., Dallas; 615 Kennedy Bldg., Tulsa; 649 S. Olive St., Los Angeles

COOPER

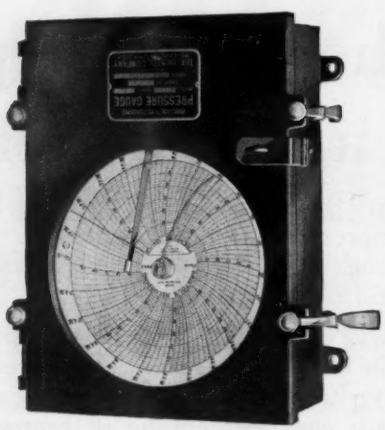
March, 1929, Volume V, Number 3. WESTERN GAS is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 3 years $5.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, California, under the Act of March 3, 1879.

A detailed record

of gas pressure maintained at outlying districts over 24-hours or a period of 7-days—

Approximately 39 Bristol's Recording Gauges similar to that shown at right give daily pressure survey. Workman is shown changing chart on instrument installed in outlying section.

AT Minneapolis Gas Co., Minneapolis, Minn., Bristol's Recording Gauges are installed at strategic points about the distribution system. Each morning charts are collected, as shown in illustration at left; providing a detailed check on pressure conditions in all sections of the city during previous 25 hours.



Bristol's Recording Pressure Gauge Model 40. Case is dust- and moisture-proof. Standard finish black enamel. Uses 12- and 8-inch charts.

Such information enables the Gas Co. to determine if adequate pressures were maintained to assure good service—to locate wrong conditions immediately and correct them before serious trouble arises—to quickly and accurately plot peak loads—to determine main capacity in relation to demand—and serves as a basis for analysis when planning improvements.

These Bristol's Instruments have been in constant operation for a number of years, and, as evidenced by the comment of plant engineer: "Not only have maintenance costs been remarkably low, but trouble-free operation has stamped Bristol's Gauges as being particularly suitable for this type of service."

Write for Catalogs, Bulletins, prices. Sales Engineering service without obligation.

The Bristol Co., Waterbury, Conn.

Branch Offices: San Francisco, Rialto Bldg.

Denver **Akron** **Chicago** **New York** **Philadelphia**
Detroit **St. Louis** **Pittsburgh** **Birmingham** **Boston**

CAST Q IRON

TRADE MARK

THIS "Q-check" mark designates Cast Iron Pipe made in accordance with established technical specifications. The Cast Iron Pipe Research Association has adopted this mark for use by its members.

All pipe, both deLavaud centrifugal and vertically sand cast, made by the United States Cast Iron Pipe and Foundry Company will hereafter bear this symbol. A representative pipe shipment marked with the "Q-check" symbol is shown in the photograph reproduced above, which was taken at the yards of this Company at Burlington, New Jersey.

United States Cast Iron Pipe and Foundry Co., Burlington, New Jersey

Sales Offices: Chicago, Philadelphia, Buffalo, Cleveland, New York, San Francisco, Los Angeles, Seattle, Birmingham, Dallas, Kansas City, Pittsburgh, Minneapolis

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BROADWAY ARCADE BLDG. SUITE 616
542 SO. BROADWAY
LOS ANGELES

STATEMENT OF NET PAID CIRCULATION OF

WESTERN GAS

For Six Months Ending December 1928

PACIFIC STATES	
California	962
Oregon	68
Washington	25
	1055

MOUNTAIN STATES	
Nevada	5
Utah	6
Arizona	15
New Mexico	7
Colorado	75
Wyoming	17
Idaho	6
Montana	31
	162

WEST SOUTH CENTRAL STATES	
Arkansas	23
Louisiana	84
Oklahoma	195
Mississippi	19
Texas	330
	651

WEST NORTH CENTRAL STATES	
Kansas	79
Minnesota	41
Missouri	41
Iowa	12
South Dakota	38
Nebraska	23
North Dakota	14
	248

EAST SOUTH CENTRAL STATES	
Alabama	3
Tennessee	4
	7

CENTRAL STATES	
Wisconsin	9
Michigan	5
Illinois	29
Indiana	12
Ohio	28
	83

ATLANTIC STATES	
Maryland	6
Pennsylvania	33
New Jersey	11
New York	42
	92

NEW ENGLAND STATES	
Connecticut	9
Massachusetts	3
District of Columbia	1
Vermont	1
	14

MISCELLANEOUS & FOREIGN	
Manila	1
Hawaii	8
Panama	5
Canada	10
South America	1
Europe	9
Cuba	1
	35

TOTAL AVERAGE DISTRIBUTION PER ISSUE....2450
TOTAL AVERAGE NET PAID PER ISSUE.....2347

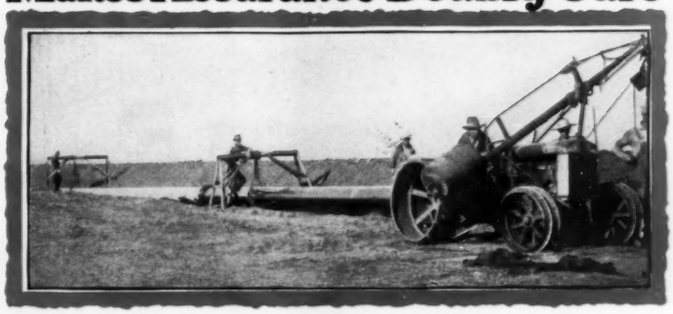
This is to certify that we have examined the circulation records of WESTERN GAS and believe the above to be a true and correct statement of this publication's distribution.

J. K. MAHONEY AND ASSOCIATES
J. K. Mahoney
Certified Public Accountants

PROOF

PROVEN PROTECTION FOR PIPE LINES

Proved where the Proving Makes Assurance Doubly Sure

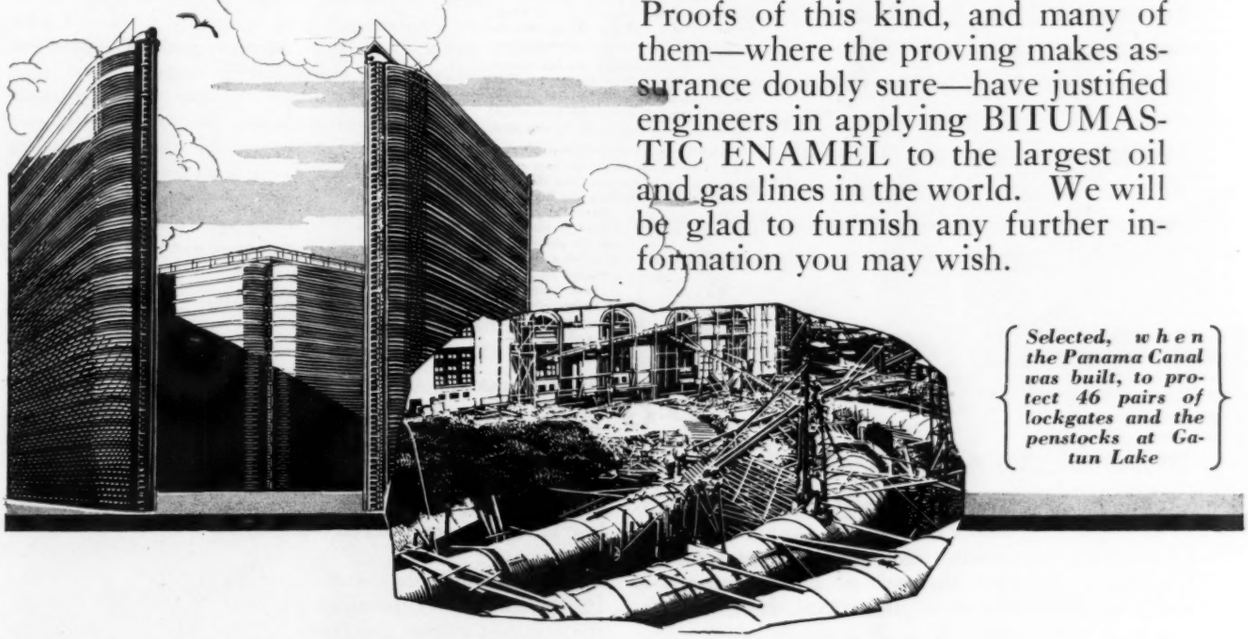


THE EMPIRE LINE

—A 20" gas line running for 420 miles between Pampa, Tex., and Kansas City. BITUMASTIC ENAMEL was used to protect 95% of this line.

Guess work plays no part in engineering. In choosing the coating (applied on more than 3,000,000 sq. ft.) to protect the lock-gates of the Panama Canal and the penstocks at Gatun Lake, the engineers selected the coating which had clearly demonstrated longest life under similar or worse conditions in the past. From among 300 other paints and compounds they selected BITUMASTIC ENAMEL—a coating which has given trouble-free protection from corrosion ever since the Panama Canal was built.

If a pipe line coating will survive when exposed to the highly corrosive waters of Gatun Lake, it is *certain* to survive on a gas or oil line where conditions are less severe. Proofs of this kind, and many of them—where the proving makes assurance doubly sure—have justified engineers in applying BITUMASTIC ENAMEL to the largest oil and gas lines in the world. We will be glad to furnish any further information you may wish.



Selected, when the Panama Canal was built, to protect 46 pairs of lockgates and the penstocks at Gatun Lake

BITUMASTIC

REG. U.S. PAT. OFF.

ENAMEL

Wailes Dove-Hermiston Corporation

17 Battery Place, New York

2464 Enterprise St., Los Angeles, Calif. 345 Vermont St., San Francisco, Calif.

Philadelphia Cleveland Chicago Houston Tulsa San Francisco

Helping Everyone Sell Ranges

After all, what is the most important thing in baking?

Modern Gas Ranges are built to insure perfect baking

Is it measuring and mixing ingredients? Is it selecting *certain* ingredients? All Home Econimists know that after all, the most important thing is the correct oven temperature.

For almost anyone using care can measure and mix good ingredients accurately and follow a tested recipe. But in the baking—that's where all your best efforts meet the real test. Women have experienced this for long years.

Today, leading Home Economists are turning to a device that keeps the oven at any temperature. It is called the Oven Heat Control and is a part of the new Gas Range.

See these new Gas Ranges at your dealer's. Or phone or call at our office. We have a selected list of modern Gas Ranges that we recommend because we know they are good.

PACIFIC GAS AND ELECTRIC COMPANY
P·G·and E·
Owned · Operated · Managed
by Californians

205-329

Every manufacturer who produces ingredients that go into the making of cakes and pies claims that the use of his ingredient is the most important thing in baking.

So we feel we must tell our women folks just what the Home Economists know so well—that the most important thing in baking is the **correct oven temperature.**

We're placing this story before P. G. and E. consumers so that they might know the truth.

Telling this truth should help everyone sell more and better gas ranges.

PACIFIC GAS AND ELECTRIC COMPANY
P·G·and E·
Owned · Operated · Managed
by Californians

245 Market Street
SAN FRANCISCO

H. M. CRAWFORD,
General Sales Manager.

BITURINE ENAMEL

THE *Permanent* PROTECTIVE COATING FOR PIPE LINES *in* QUALITY *and* SERVICE

FOR over thirty years Biturine has stood the tests of every kind of corrosive condition known; has defied soil acids, alkalis, moisture and electrolysis, on thousands of miles of pipe lines, on ships at sea, water towers, etc.

Today, Oil Industry pipe line operators know Biturine Enamel for its unvarying quality that gives added years of service to pipe lines with a complete protection against corrosive elements. What many pipe line operators do not know is that this exceptionally well "balanced" coating, made from laboratory-tested and field-proved ingredients that insure greatest permeability, resistance, ductility and tensile strength, costs no more in downright protection than ordinary straight petroleum, or straight coal tar asphalt coatings. As proof of this statement we submit as evidence numerous accelerated tests made by engineers to determine which coating was best to use, none of which showed failure of Biturine Enamel even under the most extreme conditions, as well as over thirty years of actual service in the ground.

The New Mechanical Method for coating and wrapping Pipe

A better, mechanically perfect method for coating and wrapping pipe is now available to progressive pipe line operators through Hill, Hubbell & Company's latest contribution to the Pipe Line Industry, a coating and wrapping machine, several of which have been installed in permanent plants near well-known pipe mills. We will gladly send all available data to those who address Box 1483, Tulsa, Oklahoma.

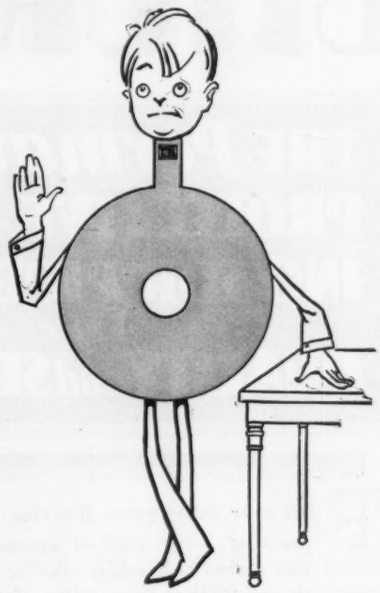
HILL, HUBBELL & COMPANY

(Division of General Paint Corporation)

Manufacturers of
Highest Grade Oil Industry Paints and Pipe Line Coatings
Factories: SAN FRANCISCO and TULSA
Offices:

SAN FRANCISCO TULSA NEW YORK LOS ANGELES HOUSTON PORTLAND SEATTLE

THE HOLE TRUTH
and
nothing but the truth



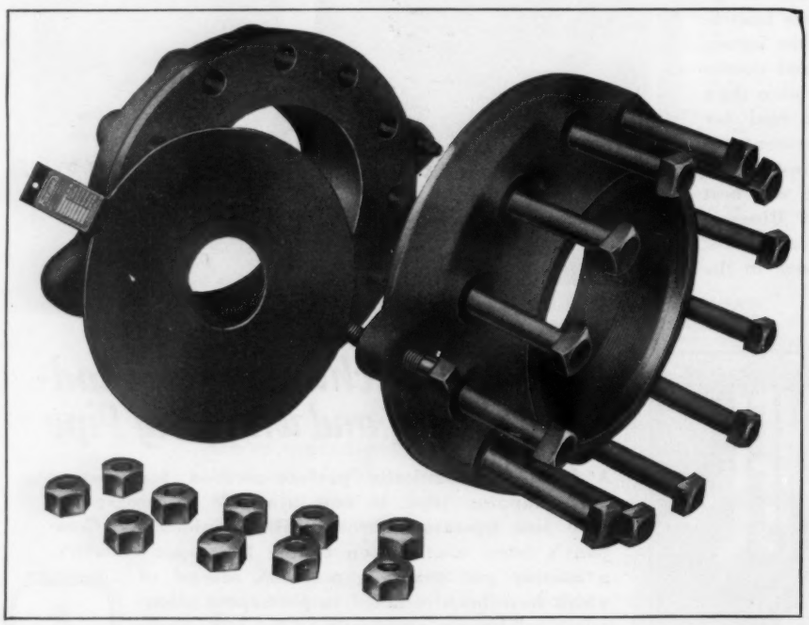
A differential gauge may be 100% accurate in itself and yet fail to give truthful measurements if the orifice plate is wrong.

Our years of experience in building meters for the oil and gas industry enable us to make orifice plates that tell the truth.

Foxboro Orifice Plates are made of steel, stainless iron or monel metal. They are machined to microscopic exactness—1/20 of 1% of the diameter of the orifice is the limit of error allowed in manufacture. These limits will produce less than one tenth of one percent (0.1%) error in measurements for orifice diameters of ½ inch or larger. The orifices have uniformly sharp and square edges. Coefficients are extremely accurate.

Installing or changing orifice plates is easy with the patented Foxboro Flange Unions. Jack screws separate the flanges. The orifice plate is reversible and automatically centered. All flanges are tapped at the factory—it is impossible to install them incorrectly.

The accurate Foxboro Orifice Plate, together with the Foxboro Flow Meter, which has no inherent error, is the combination that assures you of accurate measurements of oil and gas. Write to the nearest Foxboro Branch for further information.



Foxboro Flange Unions and Orifice Plate. Foxboro Flanges are drilled and tapped at the factory.

Agents east of the Mississippi for Robinson Patented Orifice Flange Fittings.

THE FOXBORO COMPANY

Neponset Ave., Foxboro, Mass., U. S. A.

Western Offices

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SAN FRANCISCO, 461 Market St.
PORTLAND, ORE., 816 Lewis Bldg.
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PHILADELPHIA
PITTSBURGH
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FOXBORO
REG. U. S. PAT. OFF.
THE COMPASS OF INDUSTRY

DETROIT, BOSTON
ATLANTA, TULSA
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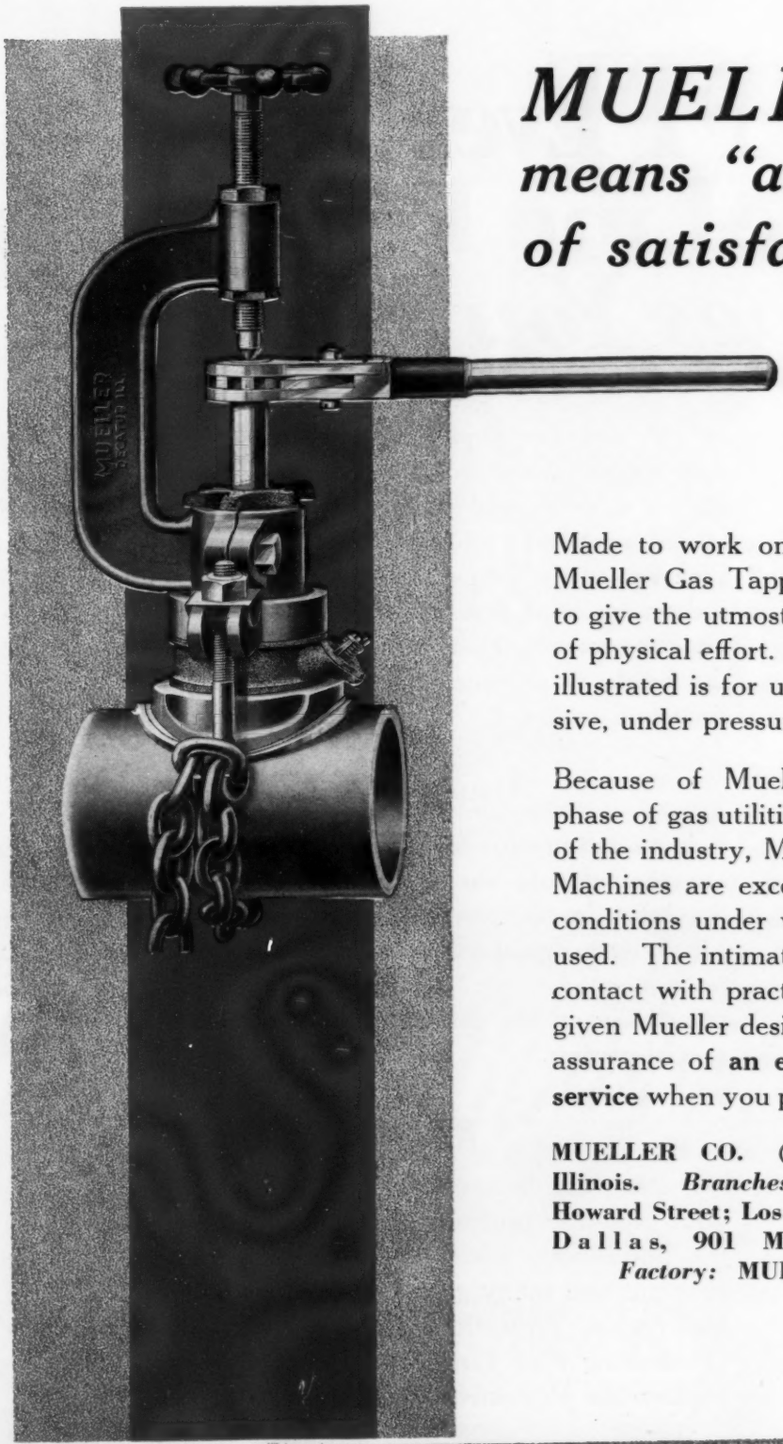
Instruments for Controlling, Recording and Indicating Temperature, Flow, Humidity and Pressure



MUELLER design *means "an extra margin of satisfactory service"*

Made to work on the pipe from any angle, Mueller Gas Tapping Machines are designed to give the utmost in results with a minimum of physical effort. The "L" Tapping Machine illustrated is for use on main 3/8" to 2" inclusive, under pressure.

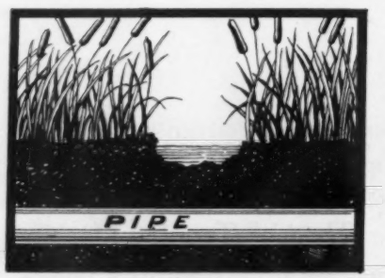
Because of Mueller's association with this phase of gas utilities since the early beginnings of the industry, Mueller Tapping and Drilling Machines are exceptionally well fitted to the conditions under which they must always be used. The intimate knowledge that such close contact with practical everyday problems has given Mueller designers and workmen is your assurance of **an extra margin of satisfactory service** when you purchase Mueller equipment.

MUELLER CO. (Established 1857) Decatur, Illinois. ***Branches:*** **San Francisco, 1072-76 Howard Street; Los Angeles, 2468 Hunter Street; Dallas, 901 McKinney Avenue.** ***Canadian Factory:*** **MUELLER, Limited, Sarnia.**

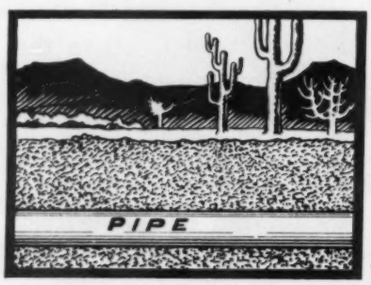
MUELLER

A request will bring complete information on the full line of Mueller gas supplies.

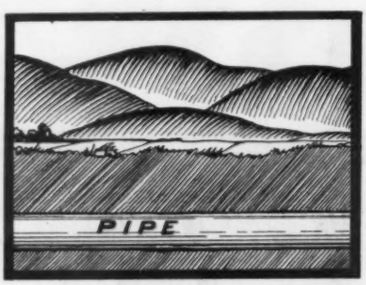
How McEverlast Plan Pipe Line Protection Saves You Money!



Thus, part of your proposed line may run through a heavy marsh-black soil, strong with alkali. Here, the maximum amount of protection is needed.



Another stretch of the same line may run through a desert soil where practically no moisture exists. Obviously the kind of protection needed for the marsh, would not be necessary for this section.



Perhaps two-thirds of the total length runs through hills—in the sweetest soil you'd want. How needless to apply the full amount of protection here!

A pipe line requires heavy protective coatings only in soils where severe corrosive conditions exist. A thick coating in a sweet soil is superfluous—a needless cost. By taking advantage of these facts, the McEverlast Plan of Pipe Protection keeps your costs at a minimum. First, the soil where your pipe is to be laid is surveyed and sample analyses made. Then protective coatings are applied to fit the needs as shown by the survey—heavy in places and lighter in others.

Usually Applied Cold

Except in extreme cases McEverlast Protective Coatings are applied cold—no danger of accidental burns to delay the job. In the words of one engineer, "You can apply McEverlast almost as fast as a man can walk and you need only a small crew." McEverlast coatings are composed principally of live Bermudez asphalt held in suspension by special process.

Pipe-line Doctors

Let McEverlast be your pipe-line doctor—diagnose your pipe-line problem and apply the needed remedy. In the Southwest, where miles of oil and gas lines are in constant use, many giant corporations have standardized on McEverlast Protection. Write today for new booklet, "Protecting Pipe Lines and Exposed Metal Surfaces with McEverlast Protective Coatings."

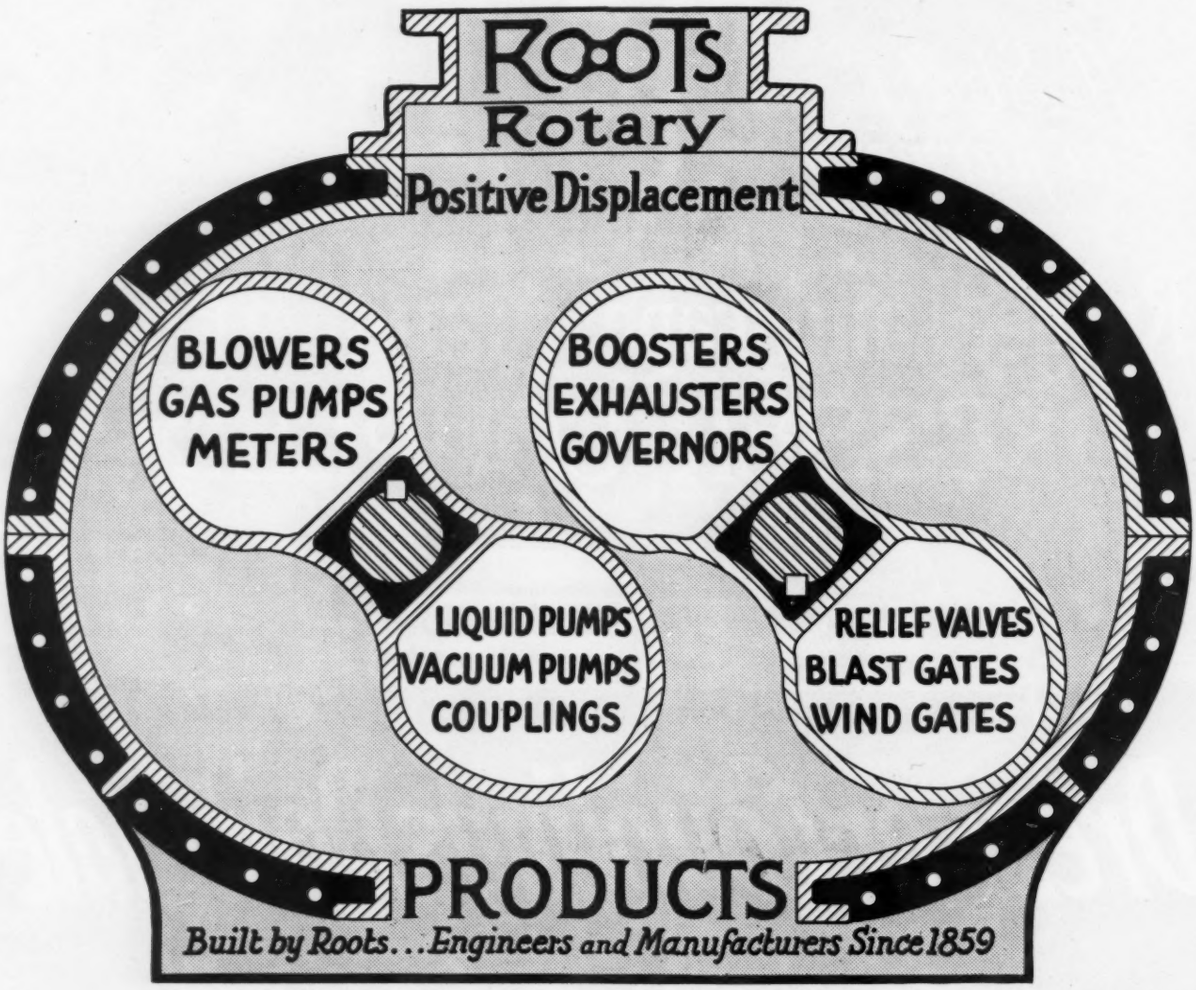
McEVERLAST, INC.
[T.M.REG.]

111 West Seventh St., Los Angeles, California
Branch Offices:
35 E. Wacker Drive, Chicago, Ill.
Magnolia Bldg., Dallas, Texas

"A Study in Harmony"
Rugged Landscape; Massive Pipe,—
DRESSER COUPLED!
Dresser Couplings Dominate
S.R.DRESSER
MFG.COMPANY
Bradford,Penna.

ROOTS

Roots of Connersville



The fact that The P. H. & F. M. Roots Company has been in business since 1859 has added significance when it is known that some of the early Roots Blowers are giving reliable and dependable service today. Specify Roots equipment by the name *"ROOTS"* to prevent substitution of imitations.

Western Representative: Sutor & Co., 2008 East Slauson Ave.
Los Angeles, California

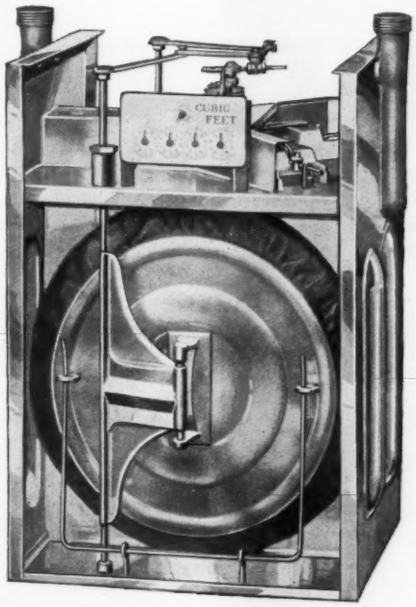
The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street

Originators of the Double Impeller Rotary Principle



The EMCO Tin Meter

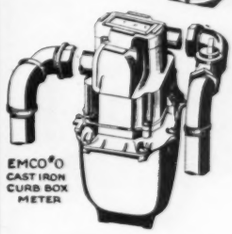
THE design and construction of the EMCO Tin Meter meets the rigid standards already set up for types of meters and regulators bearing the EMCO name. After extensive research rigid specifications were established and are constantly maintained.

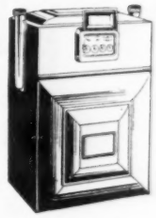
Progressive, up-to-the-minute manufacturing methods share greatly in the success of this meter. The interchangeability of EMCO A and B Type meter parts, the easily adjustable tangent, the long wearing rock shaft and the fact that each meter is proved three times before passed as "OK" spell accuracy and reliability.

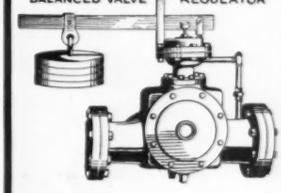
EMCO—*wherever you go.*

EMCO #0 CAST IRON DRY GAS METER

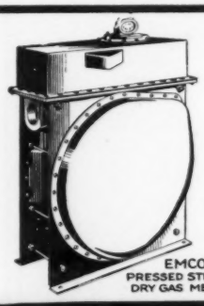
IRONCLAD CAST IRON DRY GAS METER

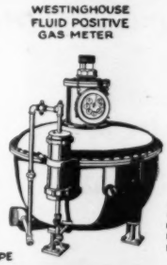

EMCO #0 CAST IRON CURB BOX METER


EMCO TIN METER

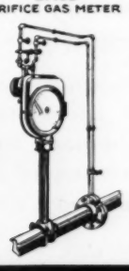

EMCO HIGH PRESSURE BALANCED VALVE REGULATOR

EMCO WATER HEATER AND GAS APPLIANCE REGULATOR

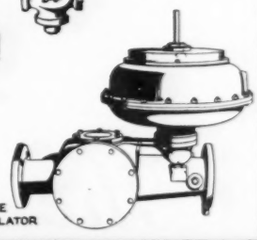

EMCO #5 PRESSED STEEL TYPE DRY GAS METER


WESTINGHOUSE FLUID POSITIVE GAS METER

EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE


EMCO ORIFICE GAS METER

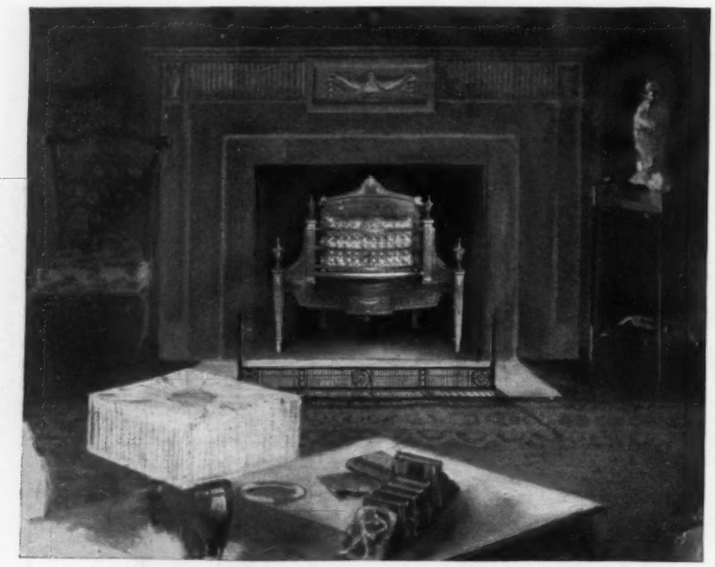
EMCO DOMESTIC SERVICE REGULATOR


EMCO LOW PRESSURE BALANCED VALVE REGULATOR

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS TULSA SEATTLE KANSAS CITY SALT LAKE CITY



The Adam period Humphrey Radiantfire with its tapered andirons, carved medallions, the urn and familiar columns is typical of the beauty of Radiantfire in period design.

Beauty on the Hearth

It is an easy matter to sell a $20 Radiantfire heater to fill a costly fireplace. But if the consumer is to be made a confirmed enthusiast for gas heat, he should be sold not a fixture he will casually replace, due to its low price, but a fire that will remain a charming and permanent part of the home ensemble.

And the period model fire, like any thing of beauty, has an appeal that the years do not lessen. It is a permanent guarantee that the fire and the gas that it consumes will never be replaced.

And after years of use, the sturdy built-in strength of the Humphrey will be shown, a fitting background to its permanent beauty and heating satisfaction.

Thus, gas heating through Humphrey Radiantfire will have become not only the satisfied habit but the real enthusiasm of the householder, pointing the way to further sales of high-grade equipment to himself and his friends.

Salesmen selling any radiant type heaters will find a wealth of information and valuable sales tips in the January issue of "Radiantfire." It is a complete manual on radiant heat. If you do not have your copy, write for it.

The
HUMPHREY
Radiantfire

Manufactured by
General Gas Light Co.
Kalamazoo, Mich.

Pacific Coast Manager
C. B. Babcock
135 Bluxome St.
San Francisco

WESTERN GAS

307 Thomas Building,
Dallas, Texas
Phone 2-8708

447 Sutter Street
San Francisco, Calif.
Phone GArfield 2772

Publication Office, 124 West Fourth Street
Los Angeles, Calif. Telephone TUcker 8982

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Publisher

GEORGE H. FINLEY
Managing Editor

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San Francisco Manager

CRAIG ESPY
Mid-Continent Manager

Volume V **March, 1929** **No. 3**

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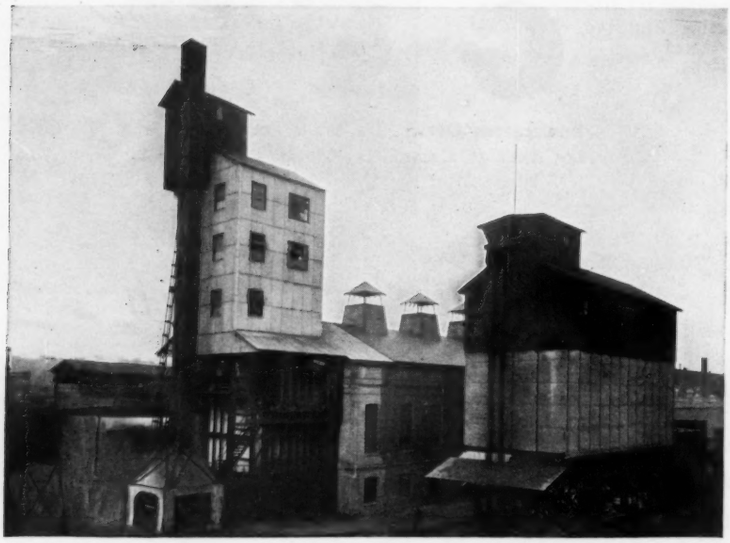
FIRST INSTALLATION
IN THE UNITED STATES



U. G. I. INTERMITTENT CHAMBER OVENS
. . . . . AT DUBUQUE, IOWA

This installation produced these results (without steaming):

Average gas made daily	637,000 cu. ft.
B.t.u. value of gas	573
Yield per pound—dry coal	6 cu. ft.
B.t.u. value per lb.—dry coal	3438
Producer fuel—dry—as charged	241 lbs.

Other installations are now in operation at Racine, Wis., and Clinton, Iowa, and one is under construction at Bangor, Maine.

We would like to discuss with gas companies any questions of new plants, replacement units or any plans for modernizing which may be under consideration.

THE U. G. I. CONTRACTING COMPANY
DIVISION OF
UNITED ENGINEERS & CONSTRUCTORS
INCORPORATED
DWIGHT P. ROBINSON, PRESIDENT
Broad and Arch Streets, Philadelphia

Chicago Atlanta

WESTERN GAS

"Reg. U. S. Pat. Off."

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in *Western America*

SAN FRANCISCO **LOS ANGELES** **DALLAS**

Cooperative Advertising

Is Succeeding *in* New England

By E. H. BAUER

General Manager
*Worcester Gas Light Company**

ABOUT six years ago I had the pleasure of being appointed by the New England Association of Gas Engineers to act on a committee to find ways and means of doing joint advertising, or cooperative advertising in New England. Gas men of New England apparently were losing their most profitable load, the domestic load. All other industries, all other forms of business, were hammering the public with advertising. Some of the large gas companies were doing some advertising, but there was a lack of co-operation, a lack of co-ordination of the advertising, and consequently some of us welcomed with open arms the co-operative method of advertising our industry.

I will try to give a very brief outline of the New England co-operative advertising scheme, to explain what has been done during the past year and then tell what our plans are for the present year.

Some of the reasons for this co-operative advertising scheme are:

1. To make the people gas conscious.
2. To stop the loss of the domestic load.
3. To retrieve some of the business that has been lost to competitive fuels.
4. To create new markets.
5. To create an interest in better and more efficient gas burning appliances, thereby again increasing the use of the appliance, and creating an increased gas consumption per consumer.

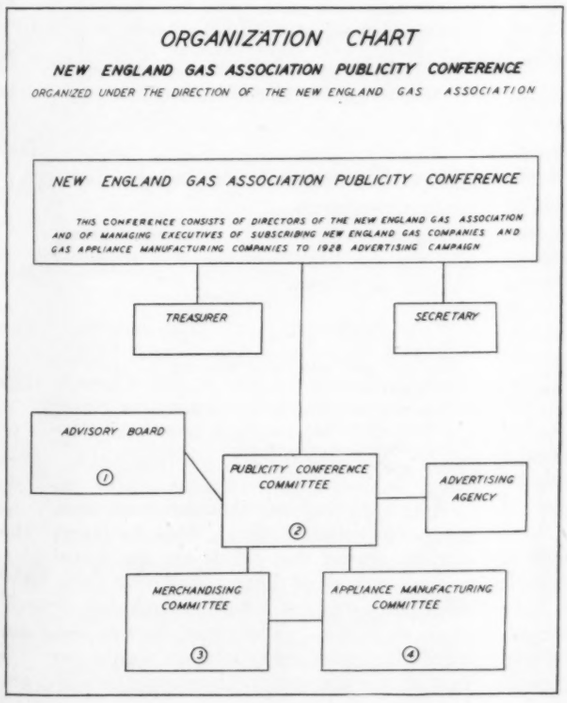

ORGANIZATION CHART
NEW ENGLAND GAS ASSOCIATION PUBLICITY CONFERENCE
ORGANIZED UNDER THE DIRECTION OF THE NEW ENGLAND GAS ASSOCIATION
NEW ENGLAND GAS ASSOCIATION PUBLICITY CONFERENCE
THIS CONFERENCE CONSISTS OF DIRECTORS OF THE NEW ENGLAND GAS ASSOCIATION AND OF MANAGING EXECUTIVES OF SUBSCRIBING NEW ENGLAND GAS COMPANIES AND GAS APPLIANCE MANUFACTURING COMPANIES TO 1928 ADVERTISING CAMPAIGN
TREASURER
SECRETARY
ADVISORY BOARD
1
PUBLICITY CONFERENCE COMMITTEE
2
ADVERTISING AGENCY
MERCHANDISING COMMITTEE
3
APPLIANCE MANUFACTURING COMMITTEE
4

Diagram of 1928 organization, New England Gas Association cooperative advertising program.

The Committee: A small committee was appointed by the directors of the New England Gas Association to outline ways and means of putting across this campaign. The committee consisted of six members. The directors felt sure that a small committee would be more efficient than a large committee, but in appointing a small committee they also felt that there might arise in the minds of some of the companies, the thought that they were not being represented; therefore, there was an advisory board appointed, this board consisting of the executives of both large and small gas companies in New England. All of the work outlined by this small working committee was and is submitted to the advisory board before it is passed along to the printer or to the newspapers to be published. In this way we feel sure that we have ample representation of large and small companies and that the material which goes forward will represent the true story that should go to the people.

Methods of Financing: The working committee, knew that to do cooperative advertising even on a reasonable scale

*Delivered on February 6 at Los Angeles, Calif., before Pacific Coast Conference of the American Gas Association Advisory Council and Executive Board.

would take a large amount of money. They also knew that it would be difficult to abruptly change the views of a great many of our gas company executives on increased advertising appropriations. Therefore they set about to draw up plans which would entail a minimum amount of money to be expended and which would cover most of the work. This finally summed up to approximate $150,000.

There was then worked out an assessment per meter which came to 12¾c. They applied that to what they estimated they could get out of all the meters in New England. There are about 1,300,000 meters in New England and after a great deal of effort approximately 80 per cent of them were represented in this co-operative advertising scheme. The number of meters represented was around 1,070,000.

From the public utility standpoint there was recognized the importance of the manufacturers—their viewpoint, their product and the fact also that they should contribute to this scheme. It was finally decided that an arbitrary figure of 1 per cent of their net sales with the gas company should be used as a basis of the manufacturers' contribution. This totalled about $30,000, and added to the other amount, gave us about the minimum amount that we could afford to spend and get results which would convince the non-participating companies of the value of this scheme.

This is what we might term the "mechanics" of the scheme in New England . . . a small committee with wide powers, backed by a large committee composed of representatives of all co-operating interests, and an assessment per meter plus the assessment on the manufacturer to arrive at a minimum fund which would give results.

It was recognized that the methods of carrying out this project must be the work of those who knew something about advertising and the advertising field. An advertising concern was selected whose major portion of business was within New England, who were local in that respect, who had the New England feeling rather than the National feeling from the advertising standpoint. The small committee worked with that advertising concern and attempted to interpret the significance of gas from our standpoint.

One very important basic element in this New England set-up was this—it was decided that we would not have a good-will campaign. None of the advertisements were to hinge on good-will or service. Many of us felt that good-will and service had been stressed a great deal and that the public today wanted something very specific and that if they got the real thing, then the good will, the appreciation of service, etc., would come of itself. The first year of our effort has been almost entirely devoted to merchandising products—water heaters, house heaters, incinerators, etc.

The Field: It, no doubt, will be of interest to know that the area of activity of the New England scheme covers 99 cities and a total of 67 gas companies; that there were 132 newspapers employed, many of which had a wide overlapping circulation in adjoining towns. The total newspaper circulation was approximately 3,450,000 and those 132 newspapers included 29 foreign language newspapers.

This Month's Cover

THIS month's cover photograph depicts the beginning of actual construction operations on the Pacific Gas and Electric Company's natural gas transmission line from the Kettleman Hills and Buttonwillow gas fields near Taft, Calif., in the San Joaquin Valley, to San Francisco, San Jose, Oakland, and adjacent territory in northern California.

Welders are shown at work on 20-inch main at Tres Pinos, San Benito County, joining 30-foot lengths into 90- and 120-foot sections and lowering it into the trench at the rate of a mile a day.

In WESTERN GAS for January the P. G. and E. natural gas project was outlined in detail. It calls for expenditure of some $13,000,000 on the laying of 282 miles of main, erection of two large gas holders—one of 10,000,000 cubic foot capacity in San Francisco and one of 8,000,000 capacity in Oakland, and other changes in the company's system made necessary by the introduction of natural gas.

The allocation of the total appropriation for the 1928 program was approximately as follows:

Water Heating	30%
Cooking	18%
Garage and auxiliary heating	14%
Refrigeration	12%
Incineration, laundry drying, etc.	9%
House Heating	8%
Miscellaneous	7%
All gas houses	3%

A great deal of thought was also given to tie-in material, for the very obvious reason that all of the gas companies, or most of them, today have their sales department which merchandises their own line. Therefore, it was decided that other material that would tie in with the newspaper advertising should be distributed to the companies. This material, mailing reprints, stickers for mail and packages, signs for automobiles etc., was sent out, all carrying the slogan *"Gas—the Better Fuel."*

As is the case with most any large project, some mistakes were made. Not everybody could be pleased. Some criticism was received. Wholesome criticism and destructive criticism, but all of the criticism was helpful. It had the desired effect of keying up those who had anything to do with the plan, and we also know that it created in the industry a consciousness on the part of many executives that more advertising should be done.

The 1929 Campaign: The plan of the campaign for 1929 is similar to that of 1928. The committee is trying to profit by the mistakes that were made last year and by the suggestions that were received, as to changes, etc. The newspaper copy will, no doubt, carry less of the printed material for reading and more to create a picture that in turn will create the desire to possess.

This year we will have a larger number of meters and companies represented and co-operating with us.

The following schedule of large size copy gives the approximate date of the appearance of newspaper copy, which will give an idea of when and what copy will appear in the papers:

February 27. (Full page) A home where Gas is the Magic Queen of Service.

March 13. (5 Col.) Laundry Dryer (Cooking).

March 17. (5 Col.) Cooking.

April 10. (5 Col.) Fireplace, d.s.h. (House Heating).

April 24. (4 Col.) Cooking.

May 8. (5 Col.) Water Heating.

May 22. (5 Col.) Refrigeration (Water Heating).

June 12. (4 Col.) Cooking.

June 26. (4 Col.) Water Heating.

July 17. (5 Col.) Incineration (House Heating).

August 17. (4 Col.) Water Heating (Cooking).

August 26. (5 Col.) House Heating (Cooking or Refrigeration).

September 11. (4 Col.) Refrigeration (Water Heating).

September 25. (4 Col.) House Heating (Cooking).

October 9. (5 Col.) Fireplace d.s.h. (House Heating).

October 23 (4 Col.) Garage Heating (Water Heating).

November 6. (5 Col.) Radiators and Com. s.h. (Cooking).

November 20. (4 Col.) Cooking (Refrigeration).

December 4. (4 Col.) Laundry Dryer (Incineration)

December 19. (Full Page) All Gas Home.

ILLUSTRATIONS

—on this page are from the 1928 cooperative advertising campaign conducted in New England.

These subjects of course will be split up into smaller advertisements to take care of local conditions in various territories. For example, 15 papers in the campaign will carry two full pages—nine advertisements 16 inches by 5 columns—and nine advertisements 12 inches x 4 columns.

Twenty-five papers will carry two advertisements 16 inches x 5 columns and 18 advertisements 12 inches x 4 columns.

Fifteen papers will carry 19 advertisements 10 inches x 3 columns.

Nineteen papers will carry 19 advertisements 8 inches x 2 columns.

Fifty-three papers will carry 10 advertisements 8 inches x 2 columns.

All of the above advertisements, however, will cover the subjects shown in the above schedule of large sized copy.

Self-mailing Broadsides: There will be four of these. One entitled "All kinds of Comfort" will cover gas fireplaces, gas garage heaters, and gas radiators. One entitled "The Greatest Invention" will cover the subject of hot water. One entitled "Treasure Beneath Your Home" will cover gas house heating, incineration, and the laundry dryer. One entitled "Priscilla Tells Secrets of the Kitchen" will cover gas ranges with heat control and the gas refrigerator.

Leaflets for Envelope Enclosures: There will be four of these envelope stuffer size. The purpose of these will be to sell gas as a whole for home convenience and on one page will be listed the various gas appliances and a brief description of the service which they render.

One of these entitled "How Priscilla's Dream Came True" covers in a sketchy manner practically all of the advantages of having a gas equipped home.

One entitled "Priscilla Solves the Servant Question" covers briefly the subjects of cooking, heating, refrigeration,

Gas
..THE BETTER FUEL
Health
and
HOT WATER
FOR successful living—health
For health—clean bodies, clean clothes, clean food, clean homes.
Doctors advise frequent hot baths—washing the hands before every meal, before touching the baby or handling food, scalding dishes, scouring everything about the kitchen, sterilizing the razor, wearing clean clothes. All are tested ways to health. And all require hot water.
At least one third of the water you use in your home should be hot.
Gas is necessary if you would have a quick, constant, dependable supply—day or night.
Call on your gas company for demonstrations of water heating, cooking, house heating, refrigeration, incineration and many other uses for GAS—THE BETTER FUEL

incineration, fireplaces, water heating and clothes drying.

One entitled "Priscilla Counts Something More Precious than Money" shows a comparison of time used in a home without gas and a home equipped with the various gas conveniences.

One entitled "What Priscilla Took for Granted" covers in a general way, and from an institutional and educational standpoint, the unfailing reliability of gas for home use.

Radio: It is planned to have a series of 26 home service talks on gas over a chain of five radio stations covering New England. These will be given something during the day and will cover the subject of gas and all its many uses.

Some of the captions for this year's advertising medium are as follows:

Breakfast
in a jiffy with
Gas
..THE BETTER FUEL
Sleep
a half-hour
longer...
NEW ENGLAND'S breakfast is only a matter of a few minutes with a gas range.
The quick, sure heat of the top burners for cereals, eggs, coffee and toast—or for a more substantial breakfast—allows you an extra half hour of sleep.
For speed, convenience, cleanliness and dependability—use GAS—THE BETTER FUEL.
Call on your gas company for demonstrations of cooking, water heating, house heating, refrigeration, incineration and many other uses for GAS—THE BETTER FUEL.

Heat Control Never Forgets. (Featuring the gas range).

Add Comfort to Any Home. (Featuring fireplaces and the gas radiator).

Priscilla Learns Secrets of Cooking. (Featuring the gas range.)

"And Can You Imagine," said Priscilla . . . *"Gas Cools It!* (Featuring the gas refrigerator).

"Our House Heats Itself," said Priscilla. (Featuring the gas house heater).

What Is Home Without Hot Water? (Featuring the gas water heater).

Summary: It is felt that this cooperative advertising will broaden our market because more people will understand the advantages of gas as a fuel; there will be more gas appliances sold and as there are more gas appliances sold there will be more dealers pushing gas appliances in order to compete with the gas companies. This, in turn, tends to increase the amount of advertising before the public eye and gradually and eventually we will be confronted with the pleasant situation of an increase instead of a decrease in the sales of gas for domestic use.

Those who have been very active with the New England cooperative advertising work during the past year urge that other regions entering upon cooperative advertising should sell this plan to the member companies for three years as the minimum time.

Economics Natural

By P. McDonald Biddison

READERS of *Western Gas* will remember the valuable contribution made by Mr. Biddison to natural gas transmission science in his paper on "Limiting Factors for Natural Gas Projects," given at the May, 1928, meeting in Dallas, Texas, of the A. G. A. Natural Gas Department, and printed in the June, 1928, issue of this publication. Mr. Biddison has again produced a paper in this important field, for the Southwest Division, A. G. A. Natural Gas Department program at Shreveport last month. The author's analysis of factors which must be reckoned with in high pressure transmission over long distances will be received with extreme interest by gas engineers.—*Editor.*

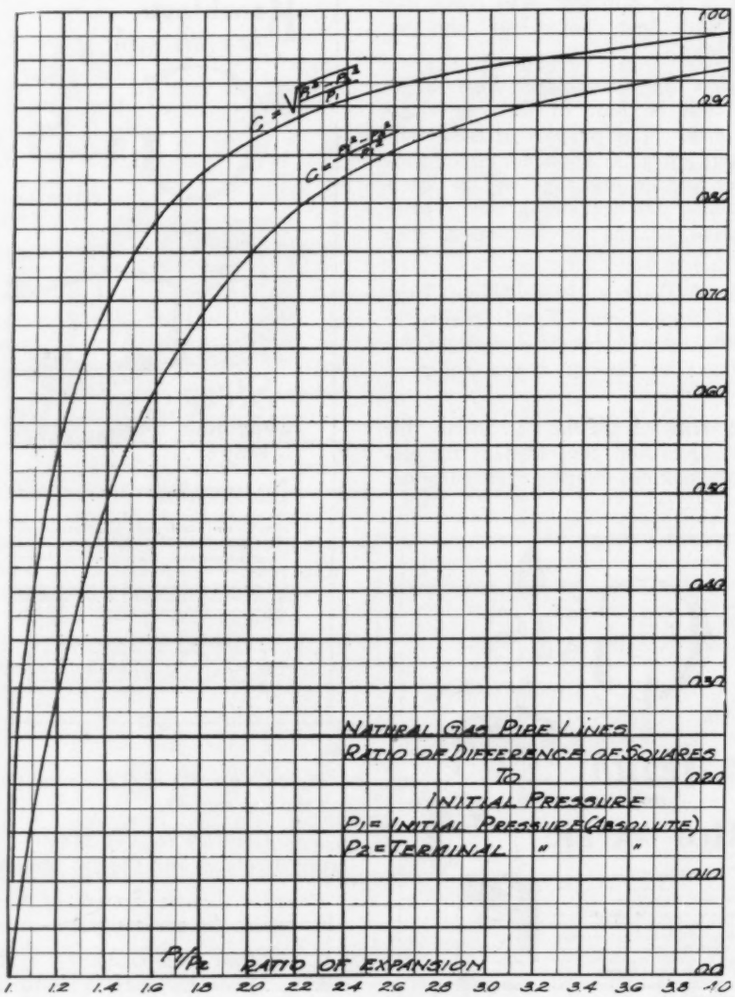

NATURAL GAS PIPE LINES
RATIO OF DIFFERENCE OF SQUARES
TO
INITIAL PRESSURE
P1 = INITIAL PRESSURE (ABSOLUTE)
P2 = TERMINAL " "
P1/P2 RATIO OF EXPANSION
1 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0

Chart 1

THE past few years have witnessed the building of natural gas systems supplying gas to markets at greater distances from the sources of supply than we have ordinarily thought feasible, and lines of even greater length are proposed than any of those yet built. Some of these propositions involve the movement of such large quantities of gas that the sizes of pipe which manufacturers can now make in quantities sufficient for the speed of construction required are too small to transmit the requisite quantity of gas for those markets at the pressures to which the industry has become accustomed. To keep the pipe size within the limits of pipe which can be had in quantity and thereby avoid excessive premiums on pipe and costly delays in construction higher pressures are being resorted to. It has as a consequence been suggested by many that even in cases of smaller quantities economies might be effected by using higher pressures, as much as 1000 or 1500 pounds, accomplishing the desired result by pipe of much smaller diameter than at the pressures in common practice. It is primarily with the possibility of effecting economy by the use of such higher pressures that this paper proposes to deal.

Commercial pipe is manufactured in standard sizes and in practice the size nearest that theoretically required must be adopted and the selected operating pressure slightly modified from the chosen condition to fit the size pipe obtainable. In making comparisons, therefore, to determine the economic effect of pressure variation any particular example may give an answer contrary to the general trend due to the variation of commercial pipe sizes from the theoretical requirements. We will assume therefore, for this discussion, that pipe is obtainable in any size desired and with walls of any thickness desired. The manufacture of steel pipe is approaching this practice though it will probably never actually reach it, especially as concerns thickness of walls.

In considering the problem we will use the formula of Thos. R. Weymouth which seems to fit experience better than any other formula for flow now in use, and in the discussion of the general principles involved we will make some approximations that will simplify the picture, even though they may do violence to the ideas of some engineers as to the degree of exactness required for such a presentation as this. On Chart I is shown the relation of the square root of the difference in squares of two numbers to the larger of the two numbers. It may be noted that as the ratio of the numbers increase the value of the square root of the differences in squares approaches the value of the larger number and when the one is less than 40 per cent of the other the value of the square root of the difference in squares is .915 of the large number. This means that under these conditions of pressure ratio in a flowing line 91.5 per cent of the maximum possible rate of flow is obtained. If, then, in a discussion of general principles we assume that for high pressures the maximum capacity is proportional to the gage pressure at the inlet, we will not have introduced any

TABLE I

Pressure Gage	Ratio to 500	Ratio of Tonnage to that of 500 lb. line
500	1	1.0000
1000	2	1.1892
2000	4	1.4142

of High Pressure Transportation *for* Gas Lines

great error. Hence we may take Weymouth's formula

$$(1)\quad Q = 871 \times D^{3/8} \times \sqrt{\frac{P_1^2 - P_3^2}{L}}$$

and for our present purpose write

$$(2)\quad Q = \frac{784 \times D^{3/8} \times P}{\sqrt{L}}$$

Where Q=Cubic feet per day
D=Inside diameter in inches
P=Gage pressure at inlet of line
L=Length in miles

Solving equation (2) for D

$$(3)\quad D^{3/8} = \frac{Q \times \sqrt{L}}{784\ P}$$

$$(4)\quad D = \left(\frac{Q}{784\ P}\right)^{3/8} \times L^{3/8}$$

We may see therefore that for any given quantity and length the diameter required varies inversely as the 3/8 power of the pressure.

The thickness of pipe walls is proportional to the diameter of the pipe and to the pressure and inversely proportional to the allowable stress in pipe walls.

$$(5)\quad T = \frac{D \times P}{2 \times S}$$

The weight per mile of pipe is proportional to diameter and to thickness and for steel weighing 0.2833 pounds per cubic inch

$$(6)\quad W = \frac{D \times T \times 3.1416 \times 5280 \times 12}{2000} \times .2833$$

$$(7)\quad W = D \times T \times 26.927$$

Substituting the value of T from equation (5) into equation (7)

$$(8)\quad W = \frac{D^2 \times P \times 26.927}{2S}$$

$$(9)\quad W = \frac{D^2 \times P \times 13.4635}{S}$$

Substituting the value of D from equation (4) into equation (9)

$$(10)\quad W = \frac{Q^{3/4} \times L^{3/8} \times P^{1/4} \times 13.4[illegible]}{784 \times S}$$

$$(11)\quad W = \frac{Q^{3/4} \times L^{3/8} \times P^{1/4}}{S} \times .0[illegible]$$

TABLE III. PRESSURE FACTOR IN LAST SECTION OF PIPE LINE, 100 LBS. GAGE OUTLET

Pounds Gage Inlet	Square of Absolute Inlet	Square of Absolute Outlet	Difference in Squares	Square Root Differences of in Squares
300	98847	13087	85760	293
400	171727	13087	158640	398
500	264607	13087	251520	501
750	584307	13087	571220	756
1000	1029007	13087	1015920	1008
1250	1598707	13087	1585620	1258
1500	2283407	13087	2269320	1506
2000	4057807	13087	4044720	2011

TABLE IV. DIAMETER REQUIRED FOR 150,000 M. C. F. CAPACITY

Pressure Gage	No Sections	200 Miles	300 Miles	400 Miles	500 Miles
300	3	24.306	26.228	27.681	28.864
	4	23.039	24.861	26.237	27.357
	5	22.062	23.805	25.124	26.197
400	3	21.765	23.484	24.786	25.844
	4	20.706	22.341	23.579	24.587
	5	19.925	21.497	22.690	23.659
500	3	20.078	21.614	22.812	23.787
	4	19.064	20.570	21.712	22.638
	5	18.351	19.801	20.102	21.791
750	3	17.233	18.594	19.624	20.464
	4	16.408	17.704	18.685	19.483
	5	15.798	17.046	17.991	18.759
1000	3	15.487	16.710	17.636	18.390
	4	14.739	15.903	16.784	17.501
	5	14.201	15.323	16.172	16.863
1250	3	14.254	15.380	16.233	16.955
	4	13.576	14.649	15.460	16.120
	5	13.073	14.105	14.887	15.523
1500	3	13.331	14.385	15.182	15.831
	4	12.686	13.700	14.460	15.077
	5	12.227	13.193	13.924	14.519
2000	3	11.966	12.911	13.627	14.209
	4	11.397	12.297	12.978	13.533
	5	10.975	11.842	12.499	13.033

TABLE II. RELATIVE LENGTHS OF SECTIONS OF PIPE LINE

2.5 Expansions — 100 lbs. Outlet at Market

Inlet Pressure Gage	Section	Length Relative to Total Length 3 Sections	4 Sections	5 Sections
300	1	.31796	.23779	.18794
	2	.32661	.24426	.19309
	3	.35543	.25090	.19835
	4	———	.26705	.20375
	5	———	———	.21688
400	1	.31347	.23375	.18538
	2	.32185	.24011	.19042
	3	.36468	.24664	.19560
	4	———	.27950	.20092
	5	———	———	.22768
500	1	.31006	.23189	.18416
	2	.31849	.23818	.18913
	3	.37145	.24465	.19432
	4	———	.28528	.19962
	5	———	———	.23277
750	1	.30682	.2300	.18295
	2	.31516	.23626	.18793
	3	.37802	.24272	.19304
	4	———	.29102	.19829
	5	———	———	.23779
1000	1	.30567	.22923	.18252
	2	.31397	.23547	.18749
	3	.38036	.24322	.19259
	4	———	.29208	.19782
	5	———	———	.23957
1250	1	.30514	.22903	.18232
	2	.31344	.23526	.18728
	3	.38142	.24166	.19237
	4	———	.29405	.19760
	5	———	———	.24043
1500	1	.30485	.22886	.18221
	2	.31314	.23509	.18717
	3	.38201	.24148	.19226
	4	———	.29457	.19749
	5	———	———	.24087
2000	1	.30456	.22870	.18210
	2	.31285	.23497	.18706
	3	.38259	.24131	.19214
	4	———	.29502	.19737
	5	———	———	.24133

TABLE V. 500 MILE PIPE LINE—150,000 M. C. F. PER DAY CAPACITY

		3 Section Line			*4 Section Line*			*5 Section Line*		
Working Pressure Gage	Stress	Dia.	Tons Per Mile	Dollars Per Ton	Dia.	Tons Per Mile	Dollars Per Ton	Dia.	Tons Per Mile	Dollars Per Ton
300	12500	28.864	281.79	112	27.357	253.14	110	26.197	232.13	109
	15000		234.83	113		210.95	111		193.44	110
400	12500	25.844	301.22	109	24.587	271.99	108	23.659	252.44	107
	15000		251.01	110		227.18	109		210.37	108
500	12500	23.787	318.96	107	22.638	288.90	106	21.791	267.68	95
	15000		265.80	108		240.75	107		223.06	96
750	12500	20.464	354.09	93	19.483	320.98	92	18.759	297.57	92
	15000		295.08	94		267.49	93		247.97	93
1000	12500	18.390	381.29	91	17.501	345.34	91	16.863	320.57	90
	15000		317.73	92		287.78	92		267.14	91
1250	12500	16.955	405.16	90	16.120	366.23	90	15.523	339.60	90
	15000		337.63	91		305.19	91		283.00	91
1500	12500	15.831	423.81	90	15.077	384.45	90	14.519	356.50	90
	15000		353.17	91		320.37	91		297.08	91
2000	12500	14.209	455.23	90	13.533	412.95	90	13.033	382.90	90
	15000		379.36	91		344.13	91		319.08	91

Note—Sizes over 22" are penalized $10.00 per ton.

TABLE VI. HORSE POWER REQUIRED FOR FIELD STATIONS, INCLUDING 12½ PER CENT ALLOWANCE FOR SPARES

500 Mile per Line — 150,000 M. C. F. per Day

Line Pressure Gage	Ratio of Compression	H. P. per Million
300	1.143	11
400	1.562	26
500	1.94	38.5
750	2.81	60.0
1000	3.825	81.0
1250	2@ 2.19	90.0
1500	2@ 2.40	102.0
2000	2@ 2.77	118.0

TABLE VII. ESTIMATE OF COMPRESSOR STATIONS

500 Mile per Line — 150,000 M. C. F. per Day

	3 Section Line		4 Section Line		5 Section Line	
Field Station	H. P.	Cost Dollars	H. P.	Cost Dollars	H. P.	Cost Dollars
300 lbs.	1695		1718		1741	
400	4006		4060		4115	
500	5932		6012		6093	
750	9245		9370		9496	
1000	12481		12649		12819	
1250	13867		14055		14243	
1500	15716		15929		16143	
2000	18182		18427		18675	
Line Sta. 1	9122		9245		9370	
2	9000		9122		9245	
3	None		9000		9122	
4	None		None		9000	
Total Line Stas.	18122		27367		36737	
Total Stas.						
300 lbs.	19817	2,612,125	29085	3,815,625	38478	5,034,750
400	22128	2,901,000	31427	4,108,375	40852	5,331,500
500	24054	3,141,750	33379	4,352,376	42830	5,678,750
750	27367	3,555,875	36737	4,772,125	46233	6,004,125
1000	30603	3,960,375	40016	5,182,000	49556	6,419,500
1250	31989	4,133,625	41422	5,357,750	50980	6,597,500
1500	33838	4,364,750	43296	5,592,000	52880	6,835,000
2000	36304	4,673,000	45794	5,894,250	55412	7,151,500

The cost of compressor stations is estimated at $45,000.00 per station plus $125.00 per installed horse power

Inspection of this equation shows the advantage of handling large quantities of gas, for since the weight of steel varies as the ¾ power of the quantity the tonnage of steel per unit of quantity decreases as the quantity increases and this economy is in addition to the lower operating costs for larger quantities.

The weight per mile varies as the ⅜ power of the length; hence the total weight required will vary as the 1.375 power of the length. Doubling the distance then increases the tonnage of steel required in the ratio of 1 to 2.5937. We may see here indications of advantages accruing by comparatively short sections between compressor stations on a long line as an offset against compressor station charges which will be considered later in discussing the question of compressor station spacing.

The effect of pressure upon the tonnage of steel required is to increase the tonnage of steel as the operating pressure increases, the weight required being proportional to the ¼ power of the pressure. If we compare the tonnage required for a line designed for 500 pounds with lines designed to operate at 1000 pounds and 2000 pounds respectively we have the ratios of pressures and tonnages shown in Table I.

(Continued on Page 38)

TABLE VIII. ESTIMATE OF INVESTMENT. 500 MILE PIPE LINE—150,000,000 M. C. F. CAPACITY

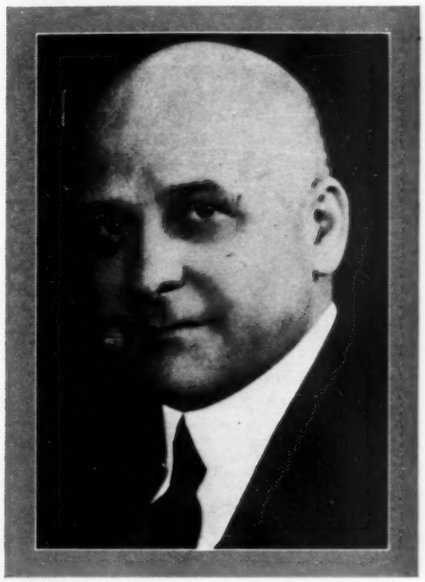
		3 Section Line			*4 Section Line*			*5 Section Line*		
Inlet Pressure Gage	Fiber Stress Pounds	Cost of Line Dollars	Cost of Comp. Stas. Dollars	Total Cost Dollars	Cost of Line. Dollars	Cost of Comp. Stas. Dollars	Total Cost Dollars	Cost of Line Dollars	Cost of Comp. Stas. Dollars	Total Cost Dollars
300	12500	23,502,500	2,612,125	26,114,625	21,527,500	3,815,625	25,343,125	19,297,500	5,034,750	24,332,250
	15000	20,137,500	2,612,125	22,749,625	18,027,500	3,815,625	21,843,125	16,547,500	5,034,750	21,582,250
400	12500	24,252,500	2,901,000	27,153,500	21,932,500	4,108,375	26,040,875	20,277,500	5,331,500	25,609,000
	15000	20,732,500	2,901,000	23,633,500	18,827,500	4,108,375	22,935,875	17,417,500	5,331,500	22,749,000
500	12500	25,137,500	3,141,750	28,279,250	22,727,500	4,352,375	27,079,875	19,687,500	5,678,750	25,366,250
	15000	21,432,500	3,141,750	24,574,250	19,432,500	4,352,375	23,784,875	16,857,500	5,678,750	22,536,250
750	12500	25,132,500	3,555,875	28,868,375	22,567,500	4,772,125	27,339,625	21,007,500	6,004,125	27,011,625
	15000	21,262,500	3,555,875	24,818,375	19,252,500	4,772,125	24,024,625	17,917,500	6,004,125	23,921,625
1000	12500	26,137,500	3,960,375	30,097,875	23,802,500	5,182,000	28,984,500	22,035,000	6,419,500	28,454,500
	15000	22,277,500	3,960,375	26,237,875	20,282,500	5,182,000	25,464,500	18,780,000	6,419,500	25,199,500
1250	12500	26,915,000	4,133,625	31,048,625	24,897,500	5,357,750	30,255,250	23,140,000	6,597,500	29,737,500
	15000	22,785,000	4,133,625	26,918,625	21,167,500	5,357,750	26,525,250	19,710,000	6,597,500	26,307,500
1500	12500	28,507,500	4,364,750	32,871,250	26,950,000	5,592,000	32,542,000	24,150,000	6,835,000	30,985,000
	15000	24,142,500	4,364,750	28,507,250	22,050,000	5,592,000	27,642,000	20,530,000	6,835,000	27,365,000
2000	12500	30,386,000	4,673,000	35,059,000	27,665,000	5,894,250	33,559,250	25,705,000	7,151,500	32,856,500
	15000	25,756,000	4,673,000	30,429,000	23,480,000	5,894,250	29,374,250	21,835,000	7,151,500	28,986,500

Natural Gas Is

Remaking *the* South

By HENRY C. MORRIS
President, Dallas Gas Company, Dallas, Texas

A Part of "Nation Wide Survey" Featuring A. G. A. Advisory Council and Executive Board Conference at Los Angeles, February 6-7



Henry C. Morris

THE progress of the natural gas industry in the South probably can be visualized best by going back a few years for the purpose of comparison. For example, 20 years ago, practically all the large cities of Texas, probably a dozen in all, had manufactured gas plants. Today Dallas, Fort Worth, San Antonio, Houston, Beaumont, in fact all large cities in the state in addition to more than 300 smaller towns, are served by natural gas with the exception of El Paso, which will have natural gas within the next few months.

A veritable web of pipe lines is spreading over Texas, Oklahoma and Louisiana, and not only is the natural product being carried to remote villages, many of which hitherto had no public utility, but it is being sent beyond the borders of these states in all directions. Texas gas is supplying the homes and industries of Denver, Colo., 340 miles from the Amarillo field, its source of supply, and of Kansas City, 425 miles from the same field. Memphis, Tenn., is receiving gas from the great Monroe field of Louisiana, and a company has been formed to pipe the product from the same field to St. Louis; another company has been organized to build a line from Monroe through Birmingham, Ala., to Chattanooga, Tenn., Atlanta, Ga., and cities enroute. A line is being built from fields in south Texas to Monterey, Mexico, and construction of a line from Lea County, New Mexico, to El Paso will be completed during the next several months. The first city in the south to have manufactured gas, New Orleans, within the past year has received natural gas supplied from the Monroe field, after using manufactured gas for 93 years. In fact, it is hard to recall a manufactured gas plant now operating in the states of Texas, Louisiana, Arkansas or Oklahoma.

Much of the impetus for this prodigious expansion is attributed to the discovery and development of the Monroe field in Louisiana and the Amarillo field in Texas, which have resulted in changing the entire face of the gas industry in the Southwest. Judge H. O. Caster of Henry L. Doherty Co., New York, in an article in the December Monthly of the American Gas Association, says that "up until two or three years ago the natural gas industry was knocking at the door of the financial institutions of this country begging for a hearing." He goes on to sketch the financial development, stating that in 1924 "there was practically no financing of natural gas companies in the United States; in 1925 there was about $5,000,000; in 1926 $45,000,000; in 1927 $86,000,000." He then states that "the particular happening which has brought about such an activity in the natural gas business has been the discovery of and the proving up of the large area of the Panhandle Texas field."

"This is probably the greatest single natural gas field that has ever been opened up in this country," says Judge Castor. "I say, probably, because we will all know more about the Panhandle field in a year or two. There is approximately a 450,000,000 cu. ft. capacity of pipe lines leading out of that territory at the present time. There is a great deal of gas being used locally in carbon black plants."

Judge Castor states that the Monroe field in Louisiana, while not so large in area as the Texas Panhandle field, is possibly just as great.

It can be seen at once that natural gas is making striking contribution to the growth and prosperity of the people and industry in the South. As proof of this we need cite only one example. The Chamber of Commerce of Dallas, which is served by my company, recently engaged a corps of nationally known engineers to make an industrial survey of the city. Their report states that one of the principal inducements for industries is the abundant supply of natural gas. Chambers of Commerce, bankers, and civic organizations throughout the state are employing this natural advantage in advertising for new industries, and many towns, by virtue of this utility, are now able to compete with the larger cities in attracting new industries.

NEW INDUSTRY

There is no doubt that gas development is one of the chief factors in bringing new industries to the South. Recently Louisiana has acquired a profitable new industry in the kraft paper mills which have located among her pine forests. Five years ago this industry was unknown in the South. The bulk of the world's sulphur supply, which comes from Texas, is now produced with gas. The south, and especially the Southwest, is bidding successfully for New England textile mills, using natural gas as one of the chief arguments. From the ginning of the cotton to its final manufcature into cloth, gas plays a prominent role. The immensely important cotton seed oil industry depends largely on gas. The by-products of this industry, such as soaps and cooking oils, use gas in abundance.

Another new industry which is now appearing in Texas is cheese manufacturing, as well as the manufacture of powdered milk and other dairy products, and they are using gas.

A list of a few important industrial users of gas in our own territory indicates what this fuel really means to the South. In the list we find such industries as these: Cement plants, pottery, hosiery, automobile finishing, cotton compresses, soap factories, ice and cold

(*Continued on Page 52*)

Selling *the* Idea *of the* Antipodes

By R. C. COLLING

HISTORICALLY, as well as geographically, the outlook of Western America is westward. This fact has its application in many industries, and *Western Gas* readers will find interest in turning their attention with the writer of this article to one section of the Far-Pacific, where the merits of the ideal fuel are being progressively emphasized on the extensive system of an Australian utility, the Colonial Gas Association, Ltd., with headquarters at Melbourne.—*Editor.*

"The Room was Instantly Flooded with Radiant Heat"

—In other words, someone lit the GAS FIRE, and it involved no greater trouble than a turn of a wrist and the striking of a match. Everything else had already been done BY THE GAS COMPANY. But it is not the convenience alone that is making GAS FIRES more and more popular. Their economy in the use of fuel it now better understood. Requiring heat, you use fuel. Requiring greater heat, you use more fuel, and if you can regulate that heat, raise it, or lower it, full on or right off, you have that degree of flexibility that is so desirable, and yet so difficult to attain—*unless you use Gas.* The use of Gas for house heating ensures permanently clean grates and the absolute certainty of a cosy fire.

And the Gas Company stores the fuel for you, ready for instant use if you want only 10 cubic feet or 10,000

THE Colonial Gas Association, incorporated in England in 1888, is a limited liability company, and is to a great extent, a holding company, owning gas works throughout Australia, several in the suburban area of Melbourne, and others in country centers. Australia's mountains and deserts, natural barriers to industrial development, are no serious impediment to the growth of this great industry, for the Colonial Gas Association and its subsidiary companies, with plants in all the chief cities, distributes gas in widely separated centers on the continent. One subsidiary is 2,000 miles away, while another is 1,200 miles from the home office. At the head of the Association, as chairman and managing director, is P. C. Holmes Hunt, an outstanding figure in Australia's commercial and industrial development, until recently president of the Australian Gas Institute. During the period from 1923 to 1928 the Association added eight gas "undertakings" (the Australian phraseology for subsidiary companies) to the companies under its control. Consumers in the Australian capital cities alone number 582,500, and according to figures given out by the publicity department of the Association, which is headed by W. B. Edwards publicity officer of the company, 3,000,000 Australians daily enjoy the comfort and convenience of gas distributed by the Colonial Gas Association and its subsidiaries.

Outstanding in the conduct of these Antipodean gas utilities is the effective use made of modern promotional methods in advertising and publicity. In many sections the gas industry is as laggard in development of its promotional program as it has been generally

in merchandising. Not so in the case of the Colonial Gas Association. This utility's promotional efforts in advertising and publicity are as broad as the company's activities. Results to which this program has contributed are seen in a 17.8 per cent gain in gas sales during the fiscal year of 1926-1927 and an 8.4 per cent gain during the fiscal year 1927-1928.

In the paragraphs below a few features of the Colonial Gas Association's publicity program are selected for discussion. The program here reviewed is modern in every way, from the peppy quarterly publication—"The Service Messenger," to the demonstrations of the Home Service Department and the radio broadcasting from station 5CL, Adelaide, Australia, of talks on the subject of gas and its by-products. The slogan of the company, which runs thematically throughout the advertising copy is "Good Public Service."

Coming as a quarterly message from the head office of the company to the managers and staffs of the various undertakings, the C.G.A. "Service Messenger" keeps the employee morale at a high level. To those employees situated in outlaying districts it brings news of the industry throughout the colonies, together with announcements of demonstrations and other information pertinent to company operation. The "Question Box" is a feature which attracts the attention of the reader, and much helpful information is carried in that column. A serial story is now running in the expectation that it will interest country gas works managers in furthering the uses of gas in their districts.

A striking example of how the Company has used display advertising in the country-wide promotion program is shown in two full-page advertisements which appeared in Melbourne newspapers during the recent Exhibition of the Electrical Trades held in that city. The Exhibition featured electrical appliances exclusively, and in order to reassure gas consumers that the strong demand for gas appliances of all sorts testified capably to the complete "up-to-dateness" of gas, the gas companies supplying the

metropolitan area of Melbourne cooperated in the publication of two full page advertisements, each of which was later reproduced in the "Service Messenger." One of them read "Gas—the Cooking Medium for Over 184,000 Melbourne and Suburban Families"—

Gas *in*

the word "Gas" being in letters four inches high. The other read "After All! When You Realize that More than 184,000 Melbourne and Suburban Homes are Using Gas Stoves—You will appreciate that Gas after all is the Dependable, Practical, and Economical Domestic Fuel."

Newspaper advertisements appear daily in the Australian newspapers, carrying the message of the economy of comfort to city and country dweller alike. Several of these are reproduced here, testifying to the use of modern methods of advertising appeal by the Antipodean gas utilities.

Direct mail advertising is prominent in the C. G. A. program. A series of "talks" was mailed out each month to Australian housewives during a recent

GAS—THE LOGICAL FUEL
is the cooking medium for over 180,000 Melbourne and suburban families.
Clean, convenient, economical, and flexible to a degree not attainable with other fuels, Gas gains yearly in public approval.
Over 13,000 families installed Gas Stoves during 1926, and the latest improvements, both in appearance and efficiency of all gas-burning appliances, coupled with the inherent good qualities of Gas itself, continue to make Gas, in an age of "up-to-dateness," the logical domestic fuel.
THE COLONIAL GAS ASSOCIATION LIMITED,
BOX HILL OAKLEIGH FOOTSCRAY WILLIAMSTOWN.

Catch Him in the Humour
When the smoke rings rise to the ceiling, and he's feeling satisfied with himself, bring up the subject of a Gas Wash Copper, or a Gas Bath Heater, or, say, a new Gas Stove, or perhaps a "Brian" Heater. Emphasise the NEED for these things. Explain that in making your work lighter, and your convenience greater, you are making HIS home more comfortable, and improving its value.
Tell him of the number of women—women you know—who are using gas daily for heating and cooking; and if it's necessary, assure him that all gas appliances are sold on particularly easy terms.
Drive home these points—HIS comfort, your convenience, and the all-round economy of gas.
"Good Public Service"
Colonial Gas Association

Specimen advertisements appearing above, and at the left of the page opposite, are selected as typical of Colonial Gas Association "copy." The small drawings, from other publicity of the same company, indicate a fresh approach to public attention.

This slogan is identified with gas fuel on the C. G. A. Australian system.

calendar year, in which the various aspects of the use of gas were presented in keeping with the passing seasons.

In the 12 talks, beginning with the month of January, when the Australian summer is at its height, the seasons are emphasized, together with the appliances which are most usable during each month. In the September "talk" gas refrigeration is featured, preparing the housewife for realizing her gas needs for the coming warm weather in December. In March, gas fires, ranges and water heaters are emphasized, with cold weather coming on. Another example of the use of direct mail advertising is shown in various pamphlets which the company has sent to its customers and prospective customers. Titles of these are suggestive of the interest which they create and sustain: "Better Ways to Happier Days," "Where Drudgery is Not and Leisure Tarries," "The Home Comfortable."

Legitimate efforts to inform the gas users of the future on the utility of gas are seen in a recent publicity activity of the Colonial Gas Association. The Education Department of Victoria, Australia, publishes a graded school paper, and as a supplement to this paper, under the head "Made in Australia" is given the story of each of the major industrial developments of that country. Gas is featured in a recent issue of this publication, and by-products of the gas industry are explained in another. Children in the grade schools will in a few years be members of the buying public, and it is for the purpose of instilling in this coming generation the spirit of support of home products that these industries are featured in the school publication, the gas industry finding a logical place in the series, as one of the oldest and most progressive of Australian industrial enterprises.

Recognizing that it is around the dining table that the fiercest battle for the consumer's dollar is being waged, the Colonial Gas Association is putting forth every effort to build up the cooking load, and it was to arouse eager interest on the part of the housewife that the company's Home Service Department was established late in 1926, under the direction of Miss Hughes of the Melbourne office. Since the date of opening, over 200 demonstrations have been held in city, suburban and country districts with an attendance of over 12,000 women. It has been found that demonstration is the keynote of successful sales, and not only do these demonstrations create a desire for modern gas appliances, but they also create and sustain a greater interest in home baking. Recipes of standard size, with gummed edges or perforations for inserting in the cook book, are distributed at the demonstrations, each showing the company's seal and slogan "Good Public Service" in a prominent place. A complete file of these recipes may be secured by sending a request to the company's Home Service Department. The programs which Miss Hughes has prepared have been most attractive and popular and the company has had definite evidence of the value of the service in the districts where demonstrations have been held. Aside from the increased load and the demand for new appliances resulting from the Home Service Department's work, its "good-will" value is stressed by the company.

Another modern innovation which has proved successful in connection with the Home Service department, is the establishment of "Gas Weeks" at various centers in the suburban districts of Victoria, one of which was held at Ipswich. While the principle attractions in this typical "Gas Week" were the cooking lectures and demonstrations during afternoon and evening sessions, the exhibits of appliances and furnishings attracted favorable attention. The recent arrival of a shipment of gas refrigerators, and the display and demonstration of one of them was a feature of the exhibits. Competitions in cooking for both school girls and adults gave zest to the program. An essay contest was held, open to all students of local schools on "The Use of Gas" and "The Impressions of Gas Week." Miss Hughes judged the cooking competitions for both classes, and it is worthwhile to mention that the winner of the first prize in the adult class had never used a gas stove before—the best of evidence as to the simplicity of the modern appliance. Following the contest the dishes cooked were auctioned and the proceeds were given to the Ipswich General Hospital. Many local stores supported "Gas Week" with the display of appliances of every type, with more than 20 firms and

(*Continued on Page 46*)

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street, San Francisco, California

A Department Conducted by Clifford Johnstone, Executive Secretary

Second Meeting *of* Northwest Commercial Men

MEMBERS of the Commercial Section Executive Committee located in the Pacific Northwest held their second meeting of the year at Tacoma on February first, with 37 present. The meeting was called by J. Earl Jones, vice-chairman of the Commercial Section, for the purpose of discussing the peculiar competitive sales problems confronting the industry in the Northwest. Mr. Jones presided at the meetings and W. J. Cady acted as secretary.

J. Earl Jones
Vice-Chairman
Commercial Section

In the absence of C. Y. Bowers, vice-president and general manager of the Washington Gas and Electric Company, the conference was welcomed to Tacoma by H. E. Seagraves, new business manager. This was followed by a report of advertising by John H. Hartog, chairman of the Advertising Committee, who presented the conclusions reached at a meeting of that committee earlier in the day. Mr. Hartog reported that the committee favored some form of co-operative advertising and felt that billboards might prove to be the most effective medium when supported by local newspaper and direct mail advertising. The discussion brought out the fact that there is a strong tendency toward disapproval of billboards adjacent to the highway, there being legislation contemplated in several states to restrict them or do away with them entirely.

H. E. Seagraves, chairman of the Refrigeration Committee, reported satisfactory progress in the sale of gas-fired refrigerators. L. A. Hubbs of the Servel Company described the load building possibilities of refrigeration, citing a Portland apartment house in which monthly gas bills had increased on the average from $1.66 to $3.04, and a survey in Seattle indicating that without refrigeration apartment occupancy was 72 per cent against 94 per cent with refrigeration.

J. F. McIndoe, American Radiator Company, reported in behalf of the Committee on Architects and Builders Co-operation that the preparation of an Architects Manual was proceeding rapidly. It is to be a loose-leaf, letter size book containing the definite information on gas needed by the architect, presented in concise form. It was pointed out by Fred Schwab and J. Fremont that the effort must not stop with the architect but must extend to owners and building and loan associations. The architect is apt to recommend the type of appliance suggested by his client.

W. J. Cady read a report prepared by C. R. Miller, chairman of the Committee on Sales Budgets. The report stressed the advantage of budgeting the income and expense of the sales department and making a day-by-day check on expense.

At this point an adjournment was taken for dinner which was followed by an evening session at which it was announced that the Annual Northwest Conference of the Association had been set for June 7 and 8 at the Empress Hotel in Victoria. There followed a discussion of the program for this conference, a number of topics being suggested. It was the concensus of opinion that sales topics should predominate.

J. Fremont then described the new sales rooms of the British Columbia Electric Power and Gas Company in Vancouver, described elsewhere in this issue. No effort has been spared to make this building complete and attractive, as the company is convinced that, if it is to increase the sale of gas, it must merchandise gas appliances in the most up-to-date way and in the best location obtainable.

Fred Schwab opened a discussion of the sale of gas to industry. This led into a discussion on rates and it was the general opinion that rates are the controlling factor in securing most large volume business.

Those in attendance were as follows: R. H. Callender, Seattle Lighting Company, Seattle; S. Delancey, Seattle Lighting Company, Seattle; D. O. Oldham, Seattle Lighting Company, Seattle; J. F. McIndoe, American Radiator Company, Portland; N. G. Fratt, Seattle Lighting Company, Seattle; Geo. Stowe, Seattle Lighting Company, Seattle; W. B. Addie, Seattle Lighting Company, Seattle; A. D. Daab, Seattle Lighting Company, Seattle; L. A. Hubbs, Servel Company, Seattle; J. Fremont, British Columbia Electric Power & Gas Company, Vancouver; Bob Carver, British Columbia Electric Power & Gas Company, Vancouver; Ed Taylor, British Columbia Power & Gas Company, Vancouver; Sydney Beck, Estate Stove Company, Portland; W. M. Dugan, Northwest Gas & Electric Equipment Company, Portland; B. W. Farnes, Minneapolis-Honeywell Company, Portland; W. T. Neill, Pacific Power & Light Company, Portland; John H. Hartog, Portland Gas & Coke Company, Portland; J. Earl Jones, Portland Gas & Coke Company, Portland; C. C. Carr, Portland Gas & Coke Company, Portland; A. E. Finley, Portland Gas & Coke Company, Portland; R. W. Coblentz, Portland Gas & Coke Company, Portland; W. J. Cady, Portland Gas & Coke Company, Portland; Ray Finch, Portland Gas & Coke Company, Portland; John Ryan, Portland Gas & Coke Company, Portland; A. G. Smith, Portland Gas & Coke Company, Portland; E. K. Anderson, Anderson, Anderson Gas Appliance Company, Portland; A. Koernschild, Seattle Lighting Company, Seattle; L. R. Crispin, Washington Gas & Electric Company, Olympia; Fred Schwab, Washington Gas & Electric Company, Centralia; H. E. Seagraves, Washington Gas & Electric Company, Tacoma; John Condon, Washington Gas & Electric Company,

Association Calendar

Technical Section, P. C. G. A. March 21, Los Angeles.

Joint Meeting with Arizona Utilities and Pacific Coast Electrical Association, April 18-20.

Northwest Regional Conference—June 7 and 8, Victoria, Canada.

Annual Convention—Del Monte, week of September 11, 1929.

Tacoma; O. V. Johnson, Washington Gas & Electric Company, Tacoma; Harold Sherrill, Washington Gas & Electric Company, Tacoma; Bryan Shea, Washington Gas & Electric Company, Tacoma; D. J. Young, Gas Engineer, Tacoma; W. D. Ginnaven, Tappan Stove Company, Tacoma; A. A. Salmon, Spokane Gas & Fuel Company, Spokane.

Changes in Commercial Committees

H. E. Seagraves, new business manager for the Washington Gas and Electric Company at Tacoma, Washington, is leaving that post on March first. Mr. Seagraves was a member of several of the Association's Commercial Section Committees and was chairman of the Committee on Refrigeration. J. Fremont of Vancouver has been appointed to replace Mr. Seagraves in this chairmanship.

L. C. Haffner, industrial sales engineer for the Portland Gas and Coke Company, has left that company to join the staff of the Albers Bros. Milling Company. Mr. Haffner's post as chairman of the Committee on Industrial Sales of Manufactured Gas will be filled by R. J. Phillips of San Diego.

P. C. G. A. Proceedings Ready for Mailing

As *Western Gas* goes to press Volume 18 of the Pacific Coast Gas Association Proceedings is practically ready for mailing. Copies will go to P. C. G. A. members early this month.

Vice-Chairman of Women's Committee Named

ANNOUNCEMENT has been made of the appointment of Miss Mildred Hinrichs as vice-chairman of the Women's Committee, Public Relations Section, Pacific Coast Gas Association. Miss Hinrichs, an employee of the Salinas Division, Pacific Gas and Electric Company, has been an active participant in Women's Committee activities for the past six years and served during that time as Chairman of the Women's Committee, Coast Valleys Gas & Electric Company. The splendid results accomplished by Women's Committee programs have resulted in the organization of several new units of this Committee in gas utilities of the Pacific Coast Section. The program for the current year includes a study of gas appliances in the home, manufacture and distribution of gas, first aid, and other pertinent subjects.

Mildred Hinrichs

First aid teams have been organized in several Women's Committee groups. This work is under the leadership of Miss Marge Myrick of the San Diego Consolidated Gas & Electric Company. Miss Myrick is also Pacific Coast member of the Safety Sub-Committee, National Electric Light Association.

Wm. G. Kerckhoff, Utility Pioneer, Dies Feb. 22

PROMINENTLY in the history of Pacific Coast commercial and industrial progress appears the name of William G. Kerckhoff, one of the founders, and for many years president of the Southern California Gas Company, who passed away suddenly at his Los Angeles home on February 22, at the age of 73.

William G. Kerckhoff

Mr. Kerckhoff was born March 30, 1856, at Terre Haute, Indiana, coming to California to join his father in business in 1878. From that time he threw all of his enterprise and resourcefulness into the progress of the Southwest, pioneering in the development of public utilities, and other interests of a large scope. During his lifetime Mr. Kerckhoff occupied the presidential chairs of many of the largest companies in California. From the time of its inception until 1927 he was president of the Southern California Gas Company, remaining with that company in the capacity of active vice-president and director since that time. He was also president of the San Joaquin Light & Power Corporation, the Kerckhoff-Cuzner Mill and Lumber Company, the Fresno Farms Company, the South Coast Land Company, and the Pacific Light and Power Corporation.

During his presidency, the Pacific Light and Power Corporation purchased the City Gas Company of Los Angeles, renaming it the Southern California Gas Company. Contracts were made at that time for natural gas from the McKittrick and Maricopa fields, and the Midway Gas Company was formed to transport the gas to the southland. One hundred and twenty miles of pipe were laid from McKittrick, over almost inaccessible mountains, where the Ridge Route highway was later constructed, to Los Angeles, giving that city the benefit of the cheapest gas of any large city in the United States at that time.

Another vision which Mr. Kerckhoff realized, was the construction of the 120-foot concrete dam at an elevation of 7,000 feet, creating the beautiful Huntington Lake, now a summer resort. With the construction of a 20,000-horsepower generator, the plant was able to transmit 175,000 volts of electricity under exceedingly difficult conditions at that time.

Upon acquiring properties of the San Joaquin Light & Power Corporation, Mr. Kerckhoff and his associates began construction of a 182,550 horsepower plant, supplying light and power for the entire San Joaquin valley, an area of approximately 34,944 square miles, and making possible the reclamation of 33,600 acres of desert land.

Although Mr. Kerckhoff was an imposing figure in the development of business interests of tremendous scope, consideration for public welfare was always of paramount importance to him. The very broadness of the interests which he developed give an index to the character of the man himself.

Louisiana Natural Gas *for* St. Louis, Mo., Industry

UNITING in a project to bring gas for industrial uses from the Richland and Monroe fields of Louisiana, to St. Louis, Missouri, the Standard Oil Company of New Jersey, the United Gas Company of Houston, Texas, the Electric Bond and Share Company, the United Carbon Company, and Moody Seagraves interests, have organized the Mississippi River Fuel Corporation, which expects to construct a 460-mile pipe line to connect St. Louis to the Louisiana gas field. Capacity of the line is planned to be 180,000,000 cubic feet daily, the line to be constructed of 22- and 24-inch pipe. Five compressor stations are contemplated en route. The line route is now being surveyed, from the field office established at Little Rock, Arkansas, and work is expected to begin in a short time.

It is the purpose of the Mississippi River Fuel Corporation to supply industrial consumers with natural gas having a heating value of 1,000 B.t.u.s. The company is not applying for a franchise for the distribution of natural gas throughout the city of St. Louis, but is asking rights-of-way to cross streets with its lines where necessary to reach the industrial districts.

It is estimated that the cost of the line and pumping stations, without including well and field costs, will amount to approximately $30,000,000, if the project is consummated as now planned.

Gas has been used commercially from the Monroe field since 1917. In Bulletin No. 12, of July 1, 1925, the Conservation Department of Louisiana estimates the reserve supply at 3 trillion 768 billion cubic feet from this field alone. Estimates of the reserve supply in the Richland field are not obtainable, but the Department of Conservation, in a report dated September 1, 1928, states that the open flow capacity of wells in the Richland district is over two billion cubic feet of gas daily.

Christy Payne, president of the Peoples Natural Gas Company of Pittsburg, and member of the board of directors of the Standard Oil Company of New Jersey, is president of the Mississippi Fuel Corporation.

EDITORIAL

Town Talk in Advertising

THE need for more "town talk" in gas company advertising was pointed out at the Shreveport meeting of the Southwest Division, Natural Gas Department, by Miss Lois Upshaw who so effectively injects that element into the advertising of the Dallas Gas Company. The gas company can afford to unbend in its message, says Miss Upshaw, and the worst thing that can be said of a piece of company copy is that it *looks* like utility advertising. Gas company messages can be up to the minute without being solemn. Get rid of the ceremonial air, urges Miss Upshaw, and keep alive to all the worthwhile community activities behind which the gas company can throw its advertising support, and, incidentally, reap a deserved reputation for being community spirited.

Let Facts be Known

ANYONE impartially minded, following the course of a propaganda campaign for municipal ownership of utilities, cannot fail to be impressed by the misstatement, exaggeration and general warping of issues which characterizes the case of municipal ownership advocates. Some of the reasoning is vicious. Much of it simply proceeds from ignorance. Where political capital is being made of such methods those responsible usually suit their arguments to what they judge to be popular fancy, overlooking the possibility that their looseness of reasoning can become a boomerang in the hands of informed utility representatives.

One case where a utility has challenged an ill-conceived municipal ownership campaign with an able presentation of facts is had in Wisconsin, where the legislative interim committee on water powers recently entertained arguments pro and con on municipal ownership. That the arguments were laid around electric utility operation does not lessen the application to the gas industry. The stand of the electric utilities was summed up in arguments presented by William J. Hagenah, vice-president and special counsel for the Byllesby Engineering and Management Corporation, and his presentation has since been published in booklet form by his company. It will be found informative reading by anyone wanting facts upon issues involved in the municipal ownership versus private ownership controversy.

In establishing that electric utility operation is not a proper function of government Mr. Hagenah points out that this industry is growing at a rapid rate, expanding into new fields, that it is developing new needs each year, that its new capital requirements are high, that it is highly technical—in short that it demands initiative and alertness in a high degree of those who conduct it. The same may be said with equal truth of the gas industry, for though old in years its present affords an entirely new picture, as changing in character as that of the electric industry. New trends in gas use and service are making the industry unrecognizable when contrasted with that of a few decades past.

Mr. Hagenah brings to light a number of faulty analogies employed by municipal ownership advocates, and calls attention to misstatement of facts as regards valuation procedure and returns upon investment. He gives, too, a history of government participation in private enterprise which is highly illuminating. Significance of the customer-employee ownership movement, so pronounced in both industrial and utility financing today, and diametrically opposed to government entry into these fields, is also given emphasis.

Facts will always command a hearing. The facts are on the side of private initiative in utility ownership and operation, and should be broadcast in the face of municipal ownership propaganda wherever it is found.

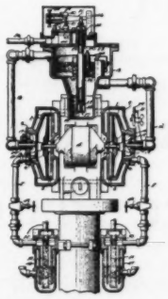
Gas Company Appearance

APPEARANCE values seem to play a constantly larger part in all forms of merchandising—including that of selling the gas company to a community. One executive makes the statement that a gas company which does not establish its headquarters in the best business block of the community, and provide facilities for its patrons equal in beauty and utility to those afforded by the up-to-date department store or bank, is overlooking its most obvious opportunity.

Few headquarters offices of western gas companies are found wanting in this respect, for executives and directorates are recognizing that money saved in office facilities is misplaced economy. The gas company insists upon proper appearance in its employees. From the same standpoint it must present a creditable face to its community in other respects.

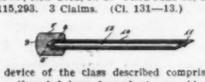
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,682,689. APPARATUS FOR REGULATING THE COMPOSITION OF MIXED GASES. CHARLES H. SMOOT, Maplewood, N. J. Filed Feb. 2, 1927. Serial No. 165,397. 14 Claims. (Cl. 236—15.)



1. In a regulator for controlling the composition of mixed gases, means for producing under like conditions two varying pressures, one affected by the density of the gas whose composition is to be regulated, and one unaffected by such density, and means responsive to both of such pressures for regulating the composition of the gas to maintain a definite relation between said pressures.

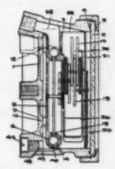
1,689,226. COMBINATION PIPE CLEANER. WILFRED J. BROWN, New York, N. Y. Filed June 11, 1926. Serial No. 115,293. 3 Claims. (Cl. 131—13.)



2. A device of the class described comprising a head having a threaded bore formed at one side thereof; a tubular stem threaded into said bore and detachable therefrom at will, one end of said stem being closed and provided with a sharpened edge, and a flexible cleaning member doubled upon itself and positioned in said stem, said cleaning member projecting beyond the end of said stem when threaded into said bore.

1,684,350. ROTARY-TYPE FLOW METER. WILLIAM WILSON HAMILL, Birmingham, England. Filed Oct. 12, 1922, Serial No. 594,204, and in Great Britain Oct. 26, 1921. 5 Claims. (Cl. 73—37.)

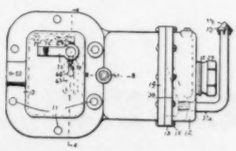
1. Apparatus of the character described, comprising a casing, a pair of separate, circular, channelled members, secured together in said casing with their channels in opposed relation and their inner perimeters spaced apart, and together forming a continuous curved fluid channel, said casing having an inlet and an outlet communicating with said channel, said outlet being above said inlet and connected to said channel at one side of the latter, a rotor



extending into the space between the inner perimeters of said members and having vanes movable in said channel and closely fitting within the latter, and indicating means in said casing actuated by said rotor and located on the opposite side of said channel to the inlet of the latter.

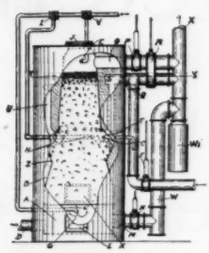
1,682,565. ROTARY COMPRESSOR. MYRON F. HILL, New York, N. Y. Filed Nov. 5, 1921. Serial No. 513,075. 9 Claims. (Cl. 230—141.)

1. In a rotary mechanism dealing with gas pressures having intake and outlet passageways, two rotor members having tooth divisions forming between them chambers which open and close by relative rotation to perform pressure functions between said passageways, one rotor within and eccentric to the other and having one less tooth division, contours on said tooth divisions providing said pres-



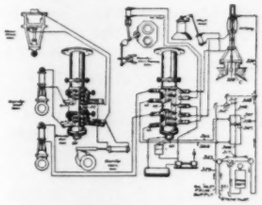
sure functions and relative angular motion, said contours of each rotor conforming to curves of envelopment outlined by the successive positions of a tooth form of the other rotor during relative angular motions which motions are those of two circles tangent internally, each in turn carrying the appropriate tooth form, and the two circles having diameters proportional to the numbers of tooth divisions of the said rotors that are to conform thereto, the angular velocity of the outer circle bearing to that of the inner circle the inverse ratio of the numbers of tooth divisions of said rotors, said rotor contours having continuous travelling engagements in the full mesh region between said passageways, and having a plurality of continuous travelling engagements between said contours on the open mesh side between said passageways, means for providing a liquid seal, end walls on opposite ends of said rotors fixed to each other directly engaging the ends of said rotors and enclosing said rotor chambers at said ends, to balance said rotors and end walls with relation to each other with a floating relation free of endwise pressure, and a driving connection to the outer rotor.

1,682,264. METHOD OF GENERATING GAS. CLAUDE W. BOTSFORD, Los Angeles, Calif., assignor to William W. Odell, Pittsburgh, Pa. Original application filed Dec. 26, 1919, Serial No. 347,566. Divided and this application filed Aug. 30, 1923. Serial No. 660,203. 16 Claims. (Cl. 48—208.)



9. A method of making water gas from solid fuel in a single generator, consisting in first air blasting an ignited fuel bed alternately up and down from substantially midway the ends of the fuel bed, then shutting off said air blast and making a straight up steam run, introducing the steam from beneath the fuel bed, and removing the finished gas from above the fuel bed.

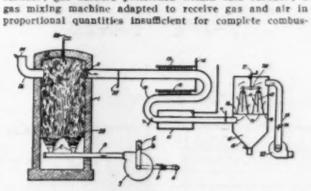
1,682,277. OIL-SPRAY PURGE MECHANISM FOR WATER-GAS APPARATUS. FRED B. HAYES, Fort Wayne, Ind., assignor to Western Gas Construction Company, Fort Wayne, Ind., a Corporation of Indiana. Filed Aug. 11, 1924. Serial No. 731,426. 7 Claims. (Cl. 48—87.)



5. An automatic oil spray purge mechanism for gas making apparatus, comprising in combination: an oil spray, means for supplying oil to said spray, means for supplying steam to said spray, and automatic means for controlling the supply of oil to said spray, said means being further operative to control the supply of steam to said spray.

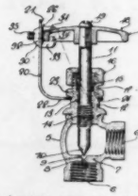
1,681,945. APPARATUS FOR PRODUCING CARBON. CHAUNCEY MATLOCK, Brooklyn, N. Y., assignor to Monroe-Louisiana Carbon Company, Monroe, La., a Corporation of Delaware. Original application filed Jan. 5, 1921, Serial No. 435,071. Divided and this application filed June 11, 1923. Serial No. 644,722. 5 Claims. (Cl. 134—60.)

1. In an apparatus for separating and recovering carbon black from a hydrocarbon gas, the combination of a furnace; gas burners positioned within said furnace; a gas mixing machine adapted to receive gas and air in proportional quantities insufficient for complete combus-



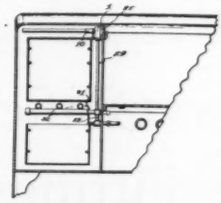
tion, and to agitate and positively mix the same; and connections between several gas burners and the mixing machine.

1,689,236. VALVE STRUCTURE. JOHN FRASER, Jr., Milwaukee, Wis., assignor to Milwaukee Valve Company, Milwaukee, Wis., a Corporation of Wisconsin. Filed Dec. 14, 1925. Serial No. 75,306. 3 Claims. (Cl. 116—125.)



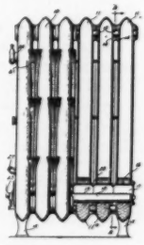
2. A valve structure, comprising a valve body having an inlet and an outlet, a port connecting the inlet and outlet, a valve member operable to close the port, a stem extending from the valve member outwardly of the valve body, an operating member on the stem, an indicating finger carried by the valve body and cooperating with delineations on the operating member to indicate the position of the valve, a substantially U-shaped stop member engaged over the periphery of the operating member and adjustable thereabout, one arm of the stop member providing a setting finger cooperating with the delineations on the operating member for the setting of the stop member, the other arm thereof engaging the valve member stem, and means for fixing the stop member with relation to the operating member, whereby the stop member cooperates with the indicating finger in the setting of the valve member at a desired point.

1,684,205. HEAT-CONTROL DEVICE FOR OVENS. ALVIN G. SHERMAN, GEORGE SMITH, and GEORGE H. RAMIG, Detroit, and CYRIL A. ROOSE, Grosse Pointe Farms, Mich., assignors to the Detroit Vapor Stove Co., Detroit, Mich., a Corporation of Michigan. Filed May 19, 1926. Serial No. 110,085. 12 Claims. (Cl. 236—15.)



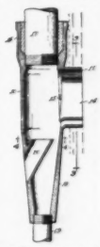
1. A heat control device for ovens, or similar structures, comprising in combination a heat control unit secured to the interior of the oven, the oven having an opening adjacent said heat control unit and a shield on the exterior of the oven readily removable to permit access to said heat control unit.

1,684,871. GAS-HEATED STEAM RADIATOR. JAMES FRANCIS FIRTH, New York, N. Y. Filed May 10, 1927. Serial No. 190,308. 2 Claims. (Cl. 237—17.)



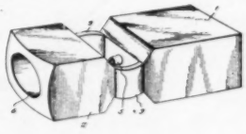
1. A gas heated steam radiator comprising a plurality of spaced and connected sections adapted to contain water in their lower portions, a transversely extending burner chamber in the lower part of the radiator and so located therein that it will be surrounded by water, a gas burner in the chamber, said chamber having openings in the top between the radiator sections for the passage of the products of combustion, and baffles extending upwardly and forwardly from the chamber adjacent the openings therein between the radiator sections for directing the products of combustion passing through said openings.

1,695,308. GAS VENT FOR GAS STOVES. FRANK E. WILT, Zanesville, Ohio. Filed Mar. 17, 1927. Serial No. 176,132. 2 Claims. (Cl. 126—307.)



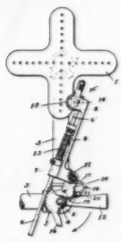
1. An appliance of the class set forth consisting of a tubular body having a lateral nipple at a point between its ends adapted for setting in the wall of a building to receive the gas-discharge pipe and also provided with an interiorly tapering depending leg or branch adapted at its lower end to be connected to a depending discharge-pipe whose interior diameter is at least equal to the diameter of the lower, tapered end of said leg to thus avoid forming an interior shoulder

1,699,318. GAS BURNER. ROBERT B. TYSON, Longview, Tex., assignor, by direct and mesne assignments, of thirty-nine per cent to Ruth Carroll Berry, Shreveport, La., and twenty per cent to Lewell C. Butler, Shreveport, La. Filed Nov 4, 1927. Serial No. 231,122. 1 Claim. (Cl. 158—99.)



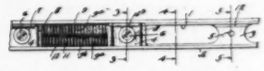
A burner of the class described comprising a front member having a bore extending entirely through the same, a rear member having a chamber therein, a pair of curved side pieces connecting the adjacent ends of the two members together, said side pieces being of less width than the width of the members, the front end of the rear member having a threaded hole therein, a nozzle threaded in said hole and extending into the space formed by the adjacent ends of the two members and by the side pieces, the rear end of the rear member having a threaded hole therein to receive a supply pipe, the rear end of the front member and the front end of the rear member having beveled upper and lower parts leaving straight central parts to which the side members are connected.

1,666,610. LIGHTING APPARATUS FOR GAS BURNERS. FRANK D. VARTANIAN, Portland, Me. Filed Mar. 12, 1927. Serial No. 174,982. 4 Claims. (Cl. 67—20.1.)



1. A lighting apparatus for gas burners, comprising a gas valve, an oscillatory frame, spark producing elements supported on said frame, a reciprocable rod in said frame adapted to engage said spark producing elements, means to reciprocate said rod simultaneously with the actuation of said valve, means to actuate said valve, means to disengage said rod from its means of reciprocation during the opening movement of said valve, and means to locate and to hold said spark producing elements in non-operating position, whereby said valve may be actuated alone and independently of said spark producing elements.

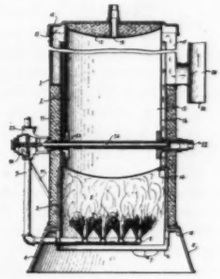
1,682,148. GAS BURNER. FRANK V. RISINGER, Lakewood, Ohio. Filed Mar. 17, 1924. Serial No. 699,896. 23 Claims. (Cl. 158—104.)



1. In a burner of the class described, a burner body having an elongated outlet forming a burner opening, and a grid comprising a length of metal bent and rebent to form the grid which is seated in said burner opening, the bent and rebent parts of the grid having contacting portions to brace the said parts.

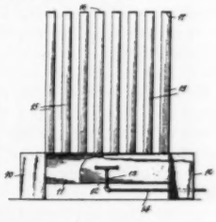
1,689,935. WATER HEATER. FRANK W SHUELL, Detroit, Mich., assignor to The Ever Hot Heater Co., Detroit, Mich., a Corporation of Michigan. Filed Aug. 2, 1922. Serial No. 579,172. 2 Claims. (Cl. 122—19.)

1. A water heater comprising an outer casing, an inner casing in spaced relation therewith a base consisting of a cylindrical shell supporting the said inner and outer casings, a cylindrical shell providing a water chamber within the inner casing the said water chamber shell being spaced from the inner casing and supported directly by the cylindrical base, the structure providing a combustion chamber below the water chamber and a space between the inner shell and water chamber opening directly to the combustion chamber, a cover member for the outer casing, the inner casing terminating short of the cover providing for an egress of gases from the inner to the outer shells at the top, the upper end of the water chamber having a heat insulated cover, insulating material in the space between the outer and inner shells extending from the bottom thereof to above the lower end of the water chamber, an exhaust flue opening through the outer



shell just above the insulating material therebetween, said exhaust flue having an opening to atmosphere below the point of connection of the flue with the shell of a diameter practically equal to that of the flue, an outlet conduit for the water chamber at the top, an inlet conduit therefor near the bottom, and a thermostatically controlled heater member in the combustion chamber.

1,684,750. HEATER. CHARLES H. THOMASSON, Richmond, Va. Filed June 10, 1926. Serial No. 115,084. 2 Claims. (Cl. 126—91.)



1. A heater of sheet-metal comprising an elongated hollow body of rectangular section merging into integral supports of similar shape, said body and supports having a flat top lying in a common plane and having an aperture midway of the under side of the body to receive a burner, said body also having a plurality of rectangular openings in its flat top extending approximately from one side of the top to the other, a set of parallel rectangular upright extensions corresponding to said openings and permanently fixed to the body, and sheet-metal closures for the upper ends of said extensions covering the same and hinged along one edge thereof.

With *the* Metermen

The Effects *on* Orifice Meter Indications *of* Various Pipe Fittings Near *the* Orifice Plate

By H. S. BEAN
Associate Physicist,
*U. S. Bureau of Standards**

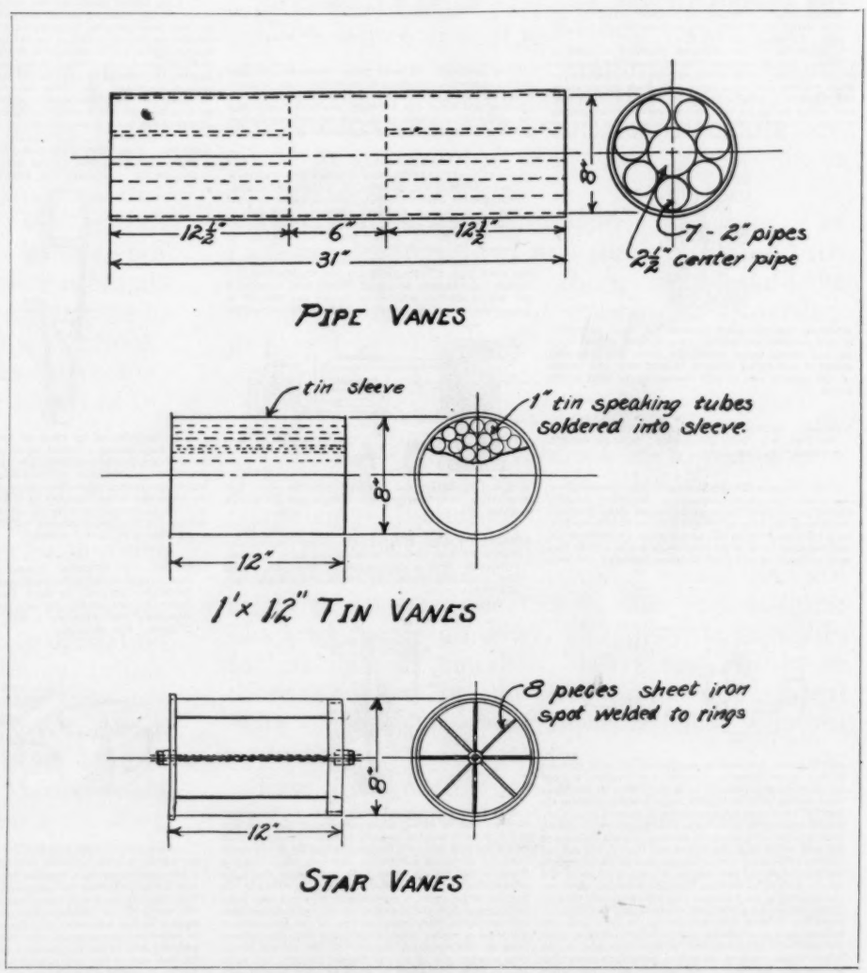
THE following paper gives a general summary of the results of certain tests made at the Daly Station of the Iroquois Gas Corporation, near Buffalo, New York, during the summers of 1926 and 1927. These tests were conducted by the Gas Measurement Committee of the Natural Gas Association, (now the Natural Gas Department of the American Gas Association) with the cooperation of the Bureau of Standards and the Bureau of Mines. The object of the tests was to obtain qualitative information of the effects upon orifice meter indications that various pipe fittings produce when the orifice is installed in a line close to such fittings.

In reviewing the results of these tests it is important to emphasize the fact that the number of combinations of possible set-up conditions used in the tests was a very small fraction of the almost infinite number of set-up combinations that can be imagined. If we were to take a narrow view of the subject, it would of course be true that strictly the results apply only to the particular set-up conditions under which each set of tests was made. However, if we disregard the numerical values obtained and consider only the nature and direction of the results, it seems entirely reasonable to draw general conclusions to serve as guides in the consideration of somewhat similar conditions. From such a standpoint the results of these tests are a very valuable aid to the practical application of orifice meters to the measurement of gas.

The majority of the tests were made with an 8-inch line, followed by a small number with a 4-inch line. The set-up comprised three orifice meter stations, two 8-inch and one 10-inch. The first or upstream 8-inch station was termed the "commercial" or test station, and the setting of this station was varied to give the different conditions desired. The other 8-inch orifice was in parallel with the 10-inch, and these two were placed between headers so that they were in

*Publication approved by the Director of the Bureau of Standards of the U. S. Department of Commerce.

Delivered by the author before the December 27, 1928, meeting of the Southern California Meter Association, at Long Beach, Calif.



Some of the straightening vanes used in the tests

Meter Association Holds Rio Hondo Session

FOLLOWING its successful "Hi-Jinks" held January 25, the Southern California Meter Association took up the course of its monthly program sessions with a meeting on February 28 at the Rio Hondo Country Club, two miles west of Downey, California, with a good representation of members present. President B. M. Laulhere called the meeting to order following a choice dinner, and a few items of business were disposed of, including the admission of one new associate and six active members.

Resignation of Carl W. Brockman as chairman of the Standards Committee, which is compiling a handbook for metermen, has been made necessary by additional duties connected with his employ, and the appointment of R. N. Brown, last year's secretary of the Association, to head the Standards Committee was announced at the February 28 meeting.

Because of his present association with a manufacturing firm, E. H. Pann, chairman of the Program Committee, has changed his status from active to associate membership and thus has found it necessary to resign from this important chairmanship. Announcement of his successor will be made by the Board of Directors in the near future.

Two papers comprised the program at the February meeting, both of them being illustrated by slides. G. H. Briggs, of the Los Angeles Gas and Electric Corporation, Seal Beach, read the first paper on "Errors in Printing Orifice Meter Charts," discussion being led by H. E. Thompson. The second paper by H. C. Waldrip of Neilan, Schumacher and Company, was on the subject of "Gas Regulation." Both papers were followed by a general discussion.

series with and downstream from the "commercial" station. These two were the reference stations and their conditions were maintained constant.

As a starting point the "commercial" line could be made up so that on the upstream side of the orifice there would be a straight run of pipe of about 60 pipe-diameters in length, then an ell and then another run of straight pipe of about the same length. On the downstream side there was a straight run of about 40 pipe diameters, then an ell and a short run of pipe to the upstream header of the reference lines. Under these conditions a given orifice plate in the "commercial" line was compared with a similar orifice plate in one of the reference lines and the ratio of their coefficients thus determined. Then the set-up condition of the "commercial" line and station was altered by the introduction of some fitting, and the ratio of the coefficients again determined. In this way the effects of the various set-up conditions used on the "commercial" line were indicated by the changes in the ratio of the coefficients.

In addition to observing the effects produced by these various fittings when near an orifice, attention was also given to the question of means of eliminating their effects. To this end a number of differently designed straightening vanes were made up and placed at different positions between the disturbing fitting and the orifice plate. The results of the tests with these vanes indicated very definitely the effectiveness of such vanes.

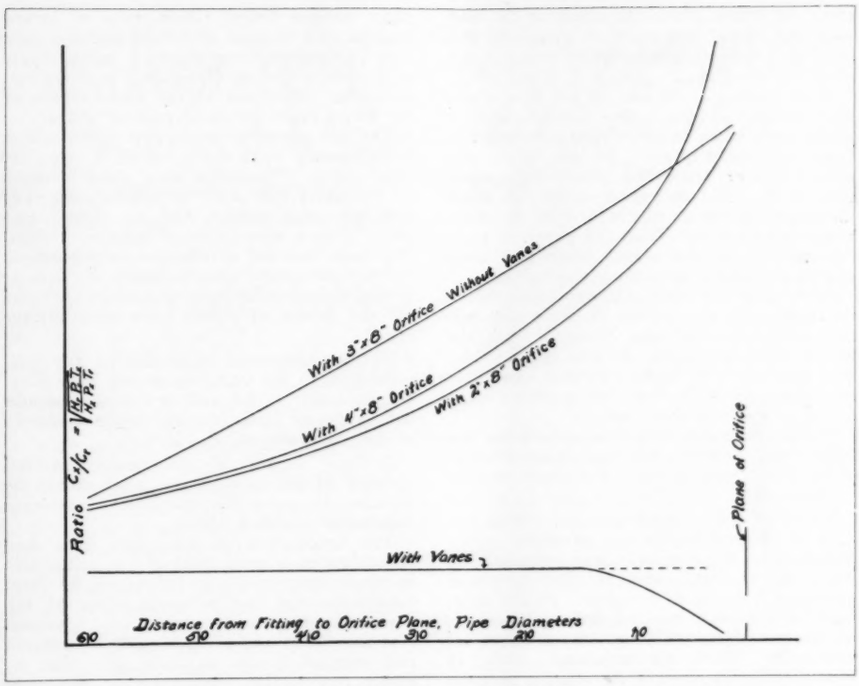
Before discontinuing the work on fitting and set-up disturbances, a few tests were made with a 4-inch commercial line in place of the 8-inch. As one would expect, the results of these tests agreed satisfactorily with those from the 8-inch line when the 4-inch line conditions were made geometrically similar to those used with the 8-inch line.

Effects of a Single Ell or Two Ells in the Same Plane, Upstream of Orifice Plate. There was no appreciable effect from a single ell or two ells in the same plane until the distance between the orifice plate and the nearest ell was reduced to about 5 pipe-diameters. Even then the ratio of the coefficients increased only slightly. When the length of straight pipe on the upstream side of the orifice plate was 10 pipe-diameters or over, the variations observed were well within the limits of the probable experimental uncertainty. Straightening vanes placed between the orifice plate and the nearest ell provided a correcting influence in some cases while in others they over corrected.

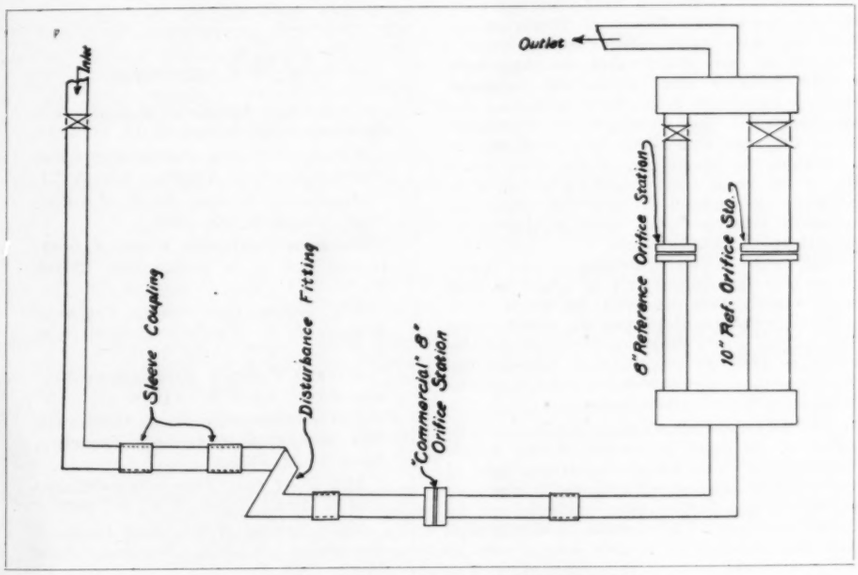
Effects of a Two-Plane Three-Ell Bend. The effects of this arrangement were definitely noticeable when the nearest ell was 60 pipe-diameters upstream. As the angles were moved nearer the orifice plate, the magnitude of the effect increased with increasing rapidity, and was 10 times greater with a straight run of only 5 pipe-diameters than with a straight run of 60 pipe-diameters.

There was some indication that as the orifice to pipe diameter ratio was increased from 0.25 to 0.5, there was a small increase in the magnitude of the effect. However, with diameter ratios of 0.69 and 0.75, the degree of inaccuracy was observed to decrease to even less than that with the 0.25 diameter ratio.

The relative distances between the angles also had an influence upon the magnitude of the inaccuracy produced by them. In the combination used in the 8-inch line combination the angles were between 2 and 3½ pipe diameters apart. A combination of angles in a 4-inch line placed the same actual distances apart as those in the 8-inch line produced only a slight inaccuracy. When these same angles were made closer together so that the distances between them in pipe-diameters were the same as with the 8-inch combination, the results were practically the same as with the 8-inch line.



Effects of a 2-plane, 3-angle bend with different sizes of orifices



Arrangement of test line for disturbance tests

The results of the few tests made with this combination of angles on the downstream side of the orifice did not indicate any appreciable inaccuracy from placing the angles in that position. However, there were not enough of these tests made to justify the positive conclusion that a combination of angles on the downstream side of an orifice would not cause any inaccuracy.

With the angles on the upstream side of the orifice plate, straightening vanes inserted between the angles and the orifice plate served to eliminate or nearly eliminate the inaccuracies caused by the angles. So long as the distances from the orifice plate to the downstream end of the vanes and from the plate to the nearest ell were about 6 and 15 pipe-diameters, respectively, no errors were observed. However, moving the angle combination and vanes nearer the orifice plate appeared to cause an inaccuracy of opposite direction to that obtained without the vanes. When the above-mentioned distances had been reduced to about 1 and 5 pipe-diameters, respectively, the magnitude of the error was about one-tenth that obtained without the vanes, but of opposite direction.

Effects of a Gate Valve. With a gate valve on the upstream side of the orifice plate, the magnitude of the errors produced by it appeared to depend as much upon the ratio of the pressures on the two sides of the valve as upon the distance of the valve

from the orifice plate. In many of the tests with the valve, this ratio of pressures was near that corresponding to the critical velocity for the gas.

With orifices of 38 and 50 per cent diameter ratios, a gate valve caused only a slight error when 35 pipe-diameters upstream from the orifice plate. As the valve was moved nearer the orifice plate, the magnitude of its effect increased rapidly to about the same amount as observed with the three angle combination. With the valve 13 pipe-diameters from the orifice plate and *wide* open there was no innaccuracy observed.

With a 75 per cent diameter ratio orifice, the valve did not appear to cause any certain inaccuracy at any distance from the orifice plate at which it was tried. This was probably due to the fact that the valve was open so wide that the pressure drop across it was relatively low.

Placing straightening vanes between the valve and orifice plate appeared to suppress nearly all of the inaccuracy caused by the valve.

Effects of a Pressure Regulator. With orifices of 38 and 50 per cent diameter ratios, the effect of the regulator was unmistakable when the regulator was 58 pipe diameters upstream from the orifice plate. As the regulator was moved toward the orifice plate, the magnitude of its effect increased rather uniformly. With the regulator about 13 pipe-diameters upstream, the effect was about the same as observed for the valve.

With a 75 per cent diameter ratio orifice, the error was less than that observed with the smaller orifices, but more than obtained with the valve under similar conditions.

As in the case of the valve, the magnitude of the pressure drop across the regulator was an important factor in determining the magnitude of the effect of the regulator. With the regulator about 13 pipe-diameters upstream, the magnitude of its effect could be varied from almost nothing when wide open to the maximum observed when the regulator was operating under the full pressure drop there obtainable.

The use of straightening vanes gave practically the same result as noted in connection with their use with the valve.

Placing the regulator on the downstream side of the orifice plate produced no definite effect so long as the distance between the regulator and the downstream pressure tap was more than 3 pipe-diameters.

The Effects of Swedges. To observe the effect of swedges, a section of the 8-inch "commercial" line on the upstream side of the orifice was replaced by some 4-inch pipe joined to the larger pipe with 4-inch by 8-inch swedges. This section of 4-inch pipe and the swedges as a unit was placed at different distances from the orifice plate. The distance that was measured each time was that from the orifice plate to the nearest (down-stream) swedge.

Using a 50 per cent diameter ratio orifice (i.e., a 4-inch by 8-inch in this case) the distance between the orifice plate and swedge was reduced to about 6 diameters of the larger (8-inch) pipe without observing any appreciable effect. Similar results were obtained when using a 38 per cent diameter ratio orifice.

When straightening vanes were placed in the larger pipe between the plate and the nearest swedge, an appreciable error was observed. The direction of the error was the same as that produced by other fittings when no straightening vanes were used.

The Design of Straightening Vanes. With but one exception, the straightening vanes used were made of short pieces of small pipe or tubing nested into a section of the main pipe, or into a sleeve which slid into the main pipe. The size of these small pipes ranged from 1-inch tube 6 inches long to two lengths of 2-inch and 2½-inch pipe 12½-inches long placed 6 inches apart in a 31-inch section of pipe. There was no noticeable difference in the effectiveness of the vanes made on these general plans.

The one exception mentioned above was a straightening vane made up of 8 strips of sheet metal. The strips were about 4-inches by 10 inches and were so fastened together that the cross section was an eight-armed star. There were several instances where this vane was not as effective as the others.

From the results obtained with the several straightening vanes used, the following rules for the design of vanes have been formulated:

1. The maximum dimension of any passage through the vane, measured in a plane perpendicular to the axis of the pipe, should not be greater than ¼ the inside diameter of the main pipe;

2. The length of the vane measured parallel to the axis of the pipe, should be at least 10 times the maximum transverse dimension specified above.

The application of these two rules may be subject to a great deal of variation, and in many cases will be influenced by local conditions and the personal ideas of the designer. It is very important, however, that the vanes should be rigidly constructed and secured firmly into the pipe line, as flimsy construction and insecure mounting have been known to cause considerable trouble.

1929 Calendar

Oklahoma Utilities Association—Oklahoma City, March 12, 13, 14, 1929.

Technical Section, Pacific Coast Gas Association—Los Angeles, March 21.

Accounting Section, A. G. A.—Chicago, March 21, 22, 1929.

Southern California Meter Association—Place to be announced, March 22, 1929.

Distribution Conference, Technical Section, A. G. A.—Boston, April 3, 4, 5, 1929.

Arizona Utilities Association—Tucson, Ariz., April 4-5, 1929.

Gas Appliance Society of California, Gas Range Week—San Francisco, April 15-20, 1929.

Mid-West Gas Association—Minneapolis, Minn., April 15, 16, 17, 1929.

Sixth Annual Meter Short Course—University of Okla., Norman, April 16-19, 1929.

Arkansas Utilities Association—Hot Springs, Ark., April 30-May 3, 1929.

Natural Gas Dept., A. G. A.—Kansas City, May 6-10, 1929.

Natural Gasoline Association of America—Tulsa, Oklahoma, May 21-22.

Northwest Conference, Pacific Coast Gas Association—Victoria, British Columbia, June 7-8, 1929.

Canadian Gas Association—Ottawa, Canada, June 13-14, 1929.

Pacific Coast Gas Association, Annual Convention—Del Monte, Calif., week of September 11, 1929.

American Gas Association—Atlantic City, October 14-19, 1929.

Utilities Association Secretaries of the United States—Chicago, December, 1929.

The Direction and Practical Interpretation of the Effects of Fittings Upon Orifice Meter Indications. The peculiar disturbances produced in a gas stream by the combination of bends, the regulator, or the valve on the upstream side of the orifice station, used in the tests had the effect of increasing the discharge coefficient. In other words, the rate of flow for any given observed differential was higher than before, or for any given rate of flow, the differential was lower. Consequently, if the meter gave correct indications before the disturbances were introduced, it would read low afterwards, and disturbances of the sort mentioned made the meter "slow."

As mentioned before, there were a few instances when a straigthening vane and fitting were very close to the orifice station, in which the vanes caused a slight over correction, that is, the discharge coefficient decreased slightly from its normal value. From what has been said above it is evident that the effect of such a condition is to make the meter "fast."

With all of the fittings tried on the upstream side of the orifice station, it was found possible to so arrange the set-up that correct measurements could be obtained. When the fitting was only an ell or two ells in the same plane, it was necessary to have only about 15 pipe-diameters of straight pipe on the upstream side of the orifice station. With all other fittings, except the swedge, it was necessary to use straightening vanes in addition to the straight run of about 15 pipe-diameters. The position of the vanes should be such as to leave at least 6 pipe-diameters of clear pipe between them and the orifice plate. There should be at least 10 pipe diameters of clear pipe between a swedge and the orifice plate, and there should be *no* straightening vanes between it and the plate. While no appreciable inaccuracies were observed when some of the fittings were placed on the downstream side of the orifice station, it is believed desirable to have at least 3 pipe-diameters of celar pipe between the downstream pressure tap and any fitting.

ARIZONA UTILITIES ASS'N TO MEET APRIL 4

THE Fourth Annual Convention of the Arizona Utilities Association will be held at El Conquistador Hotel in Tucson, Arizona, on April 4-5-6 instead of April 18-19-20, as formerly announced. Due to the exceptionally large reservation list, it was necessary to change the date in order to have the exclusive use of the hotel.

Captain A. E. Higgins, of the American Gas Association, will address the Association on gas sales, and P. M. Downing, president of the Pacific Coast Electrical Association, will also be one of the principal speakers.

M. A. Pooler, president of the Arizona Utilities Association, and vice-president and general manager of the Tucson Gas, Electric Light and Power Company, with his different committees, is making arrangements to extenl to all the delegates the hospitality of Arizona.

Many phases of the industry will be covered during the two-day business session. The third day will be devoted to a trip through the old Spanish Mission along the Mexican boundary and end with a dinner-dance at Nogales, Sonora, Mexico.

TONAWANDA, KANS., NOW HAS NATURAL GAS

Tonawanda, Kansas, is now receiving natural gas from the Cities Service Gas Company's 20-inch line from the Texas Panhandle.

Western Gas Salesmen's Competition

Prizes: $50.00 in Gold Each Month

Contest Details Published Elsewhere on This Page

First Lap of Contest Near Close—Winners Named Next Month—New Contest Now Open

OUR first monthly contest, announced in the February issue, on the subject "The Three Most Effective Arguments I Use in Selling Gas Ranges," has already evoked response from California, Colorado, Kansas, Minnesota, Missouri, Montana and Washington, with a number of days remaining before the closing date—March 11. Salesmen from these and other western states are jumping at the opportunity to enter friendly rivalry with fellow salesmen, and sales executives are taking note of the showings made in the *Western Gas* contest, with more than average interest. Witness the following letter addressed to *Western Gas* by one western sales department head:

SOUTHERN COUNTIES GAS COMPANY
OF CALIFORNIA

Los Angeles, Calif., Feb. 11, 1929.

Mr. George H. Finley, Managing Editor
Western Gas
124 West Fourth Street
Los Angeles, California

Dear Sir:

I have just noted with a considerable degree of interest your plans for a "Salesmen's Competition," announced in the February issue of *Western Gas*. This appears to me to be a splendid undertaking on the part of your publication and as one interested in the development of the commercial side of our business, I wish to commend *Western Gas* on this very excellent movement.

The writer has urged that each of our 30 or more sales representatives enter your contest and I shall be keenly interested in looking for the announcement of the monthly winners. Here is an opportunity for the individual salesman throughout the West to point out the most effective selling arguments he uses in closing contracts for approved gas appliances. I am of the opinion that this contest will prove of great value to the gas appliance salesman because he may learn how the other fellow in another territory or county is successfully merchandising gas appliances.

Very sincerely yours,

CLYDE H. POTTER,
General Commercial Agent.

The above letter is typical of the expression received from sales managers throughout the entire West. This manifest interest of sales executives should spur every gas appliance salesman to enter these monthly contests.

Beginning with the April issue the winners of each monthly contest will be announced in the contest department. In the April issue names of the gas range contest winners will be published, together with the winning replies.

The second contest, which will be open until April 11, will be in the field of gas water heater sales, the subject being, "The Three Most Effective Arguments I Use in Selling Gas Water Heaters." Each entrant is asked to produce the three most effective sales points used in selling a prospective water heater buyer. Each of these three sales points may be outlined in 100 words, thus limiting the manuscript of each entrant to 300 words. Contest conditions elsewhere on this page should be read carefully and, above all, contestants should get to work immediately so that their replies may be in the hands of the *Western Gas* Contest Editor not later than April 11. Winners on this contest will be announced in the May issue.

Prize money for the gas range contest will be dispatched to the fortunate three winning salesmen upon publication of our April issue.

Each month new contest topics will be announced on this page. Sales managers will do well to bring this department of *Western Gas* to the attention of every individual salesman on their payroll.

GAS APPLIANCE SALESMEN: Start now to gather your thoughts on water heater selling for the current contest. What are the best arguments to employ? How can these "best arguments" be put across? Remember that the closing date on the water heater contest is April 11. Your manuscripts cannot be accepted after that date. Throw the best of your selling experience into the open forum of these WESTERN GAS contests! You will benefit. Other salesmen will benefit. And the industry as a whole will benefit from this practical exchange of opinion on live sales problems.

CONTEST CONDITIONS

Subject: "THE THREE MOST EFFECTIVE ARGUMENTS I USE IN SELLING GAS WATER HEATERS"

Who May Compete: Any regular reader of WESTERN GAS who is engaged in selling gas appliances to the public, either through gas utilities or dealers.

Prizes: For the most convincing three arguments, $25.00 in gold. For the second best three arguments, $15.00 in gold. For the third best three arguments, $10.00 in gold.

Contestants will be limited to 100 words for each argument—entire reply not to exceed 300 words. No mention of manufacturers' products by trade name may be made, and contestants should refrain from comparing one manufacturer's product directly with another.

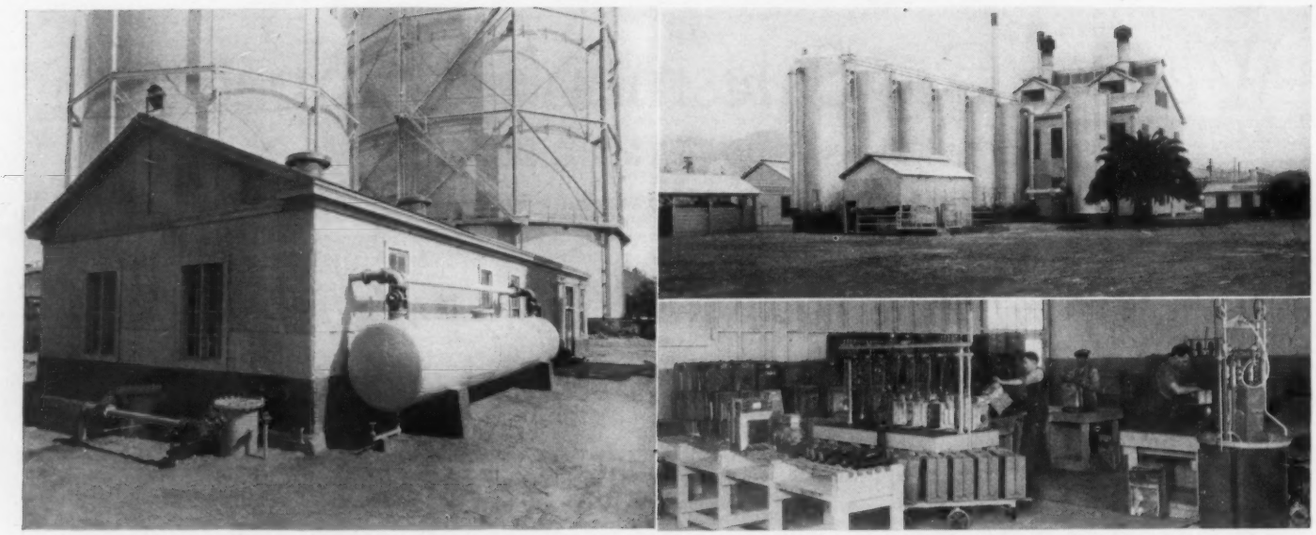
Manuscripts must reach publication offices of WESTERN GAS, not later than *April 11, 1929.* Address all communications to *Contest Editor,* WESTERN GAS, 124 West 4th Street, Los Angeles, Calif.

Name, address, company affiliation and position of contestant must appear on each page of manuscript. Double-spaced, typewritten replies, printed on one side of sheet only, are preferred. Manuscripts become property of WESTERN GAS, to be published or withheld as desired, and no responsibility for their return is assumed.

Winning replies will be published in the May issue of WESTERN GAS and prize money paid to winners at that time.

Judging of replies will be conducted by Clifford Johnstone, Executive Secretary of the Pacific Coast Gas Association, assisted by a committee.

Monthly Contests: **In the April issue of *WESTERN GAS* another Salesmen's Competition, open to readers of *WESTERN GAS* (Prizes, $50.00 in gold) will be announced, the winning replies to be published in the issue of June, 1929.**



Premium winning plants in Pacific Gas and Electric Company's Good Housekeeping Competition for 1928. Left: Santa Rosa Holder Station, first prize holder stations class. Upper right: San Rafael gas plant, first prize, production plant class. Lower right: San Rafael meter shop, first prize, Class A, meter and regulator shops.

P. G. *and* E. Makes Good Housekeeping Awards

THE Good Housekeeping Plan of the Pacific Gas and Electric Company, inaugurated in 1927, with the object in view of encouraging good housekeeping methods among the staffs of the various plants and shops of the company, finds the North Bay Division the big winner of the 1928 awards, having obtained seven out of the total fourteen awards that are offered in this competition.

To A. E. Englebright, division superintendent of the Gas Department, and to his immediate superior, H. G. Ridgway, division manager, goes the credit for this splendid showing.

The North Bay Division also won in a number of the drives last year under the leadership of W. H. Bahr, predecessor of Mr. Englebright.

A recent letter from the office of W. S. Yard, vice-president in charge of gas construction and operation, shows the following findings of the General Rating Committee:

In the production plants, first place was won by San Rafael, of the North Bay division; second place by Salinas, of the Coast Valleys; and third place by Sacramento, of the Sacramento division.

Of the holder stations, Santa Rosa, of the North Bay division, won first place; Petaluma, also of the North Bay division, won second place; and 50th Avenue, Oakland, of the East Bay division, won third place.

The meter and regulator shops were divided into two sections, Class "A," and Class "B." In Class "A," first place was won by San Rafael, of the North Bay division; second place was won by Sacramento, of the Sacramento division; and third place was won by San Jose, of the San Jose division. In Class "B," first place was won by Petaluma, of the North Bay division; second place was won by Santa Rosa, also of the North division; and third place was won by Salinas, of the Coast Valleys division.

The Premium Property Awards for the best kept property, went to the meter and regulator shop in San Rafael of the North Bay division for the Central section, and to the meter and regulator shop in San Jose of the San Jose division for the Southern section.

Natural Gas Convention Committee Personnel Announced

WHEN the Natural Gas Department of the American Gas Association convenes in Kansas City on May 6, members of the Association will find that the committee handling the arrangements has attended to every detail in making the 1929 conclave the "biggest and best."

Convention Hall is being utilized for the exhibits, and many applications are being received for space, according to C. W. Berghorn, director of exhibits for the A. G. A.

Samuel W. Meals, chairman of the Natural Gas Department, has announced the appointment of the following convention committees:

Program Committee—A. W. Leonard, Devonian Oil Co., Tulsa, Okla., chairman; N. C. McGowen, The Palmer Corp., Shreveport, La.; F. L. Chase, Lone Star Gas Co., Dallas, Texas; T. H. Kerr, Ohio Fuel Gas Co., Columbus, Ohio; Major T. J. Strickler, Kansas City Gas Co., Kansas City, Mo.; H. C. Cooper, Peoples Natural Gas Co., Pittsburgh, Pa.; T. R. Weymouth, Oklahoma Natural Gas Co., Tulsa, Okla.; Eugene Metz, Metric Metal Works, Kansas City, Mo.; W. H. McKenzie, Wyandotte County Gas Co., Kansas City, Kan.; H. L. Montgomery, Empire Companies, Bartlesville, Okla.; H. C. Palmer, Iroquois Gas Corp., Buffalo, N. Y.

Entertainment Committee: Major T. J. Strickler, Kansas City Gas Co., Kansas City, Mo.; Paul C. Ford, Kansas City Gas Co., Kansas City, Mo.; T. H. Barton, El Lorado, Ark.; T. R. Weymouth, Oklahoma Natural Gas Corp., Tulsa, Okla.; L. B. Denning, Lone Star Gas Co., Dallas, Texas.

Exhibition Committee: F. M. Rosenkrans, The Gas Service Co., Kansas City, Mo., Chairman; O. T. Dawson, National Supply Co., Tulsa, Okla.; W. E. Derwent, Geo. D. Roper, Corp., Rockford, Ill.; N. A. Newton, Okla.; E. F. Schmidt, Lone Star Gas Co., Dallas, Texas; Fred B. Thomas, The C. & G. Cooper Co., Mt. Vernon, Ohio; H. Leigh Whitelaw, American Gas Products Corp., New York, N. Y.; C. R. Zeskey, Pittsburgh Equitable Meter Co., Kansas City, Mo.; C. W. Berghorn, Director of Exhibits, A. G. A., New York, N. Y.

Transportation Committee: Arthur Booth, Pittsburgh Supply Co., Pittsburgh, Penn., Chairman, who will handle transportation of delegates from Pennsylvania, West Virginia and Ohio. William G. Dickey, Pacific Meter Works, San Francisco, Cal., who will handle transportation of delegates from Pacific Coast as far East as Colorado. William C. Grant, secretary, Southwest Division, Dallas, Texas, who will handle transportation of delegates from entire Southwestern territory. George Wehrle, Public Service Company of Colorado, Denver, Colorado, who will handle transportation of delegates from Colorado, Wyoming, etc.

$50.00

for gas appliance salesmen. **See page 33.**

GAS APPLIANCE SOCIETY OF CALIF. PLANS SPRING ACTIVITIES

The annual spring feature week on gas appliances, to be known this year as the Annual Gas Range Week, was discussed at the Feb. 20 meeting of the San Francisco unit of the Gas Appliance Society of California held in the Plaza Hotel in conjunction with the regular monthly luncheon.

The date set for this year's activity is April 15 to 20. The contest features that have marked past drives will be eliminated in the 1929 plans, although the program of publicity and advertising will be followed, as before.

The special feature offered to induce more business during the week will be a free oven heat control with every range costing $100 or over, purchased during the week.

Gas Range Week will be a state Society activity, in general charge of F. U. Naylor, secretary.

The San Francisco unit has gone on record with a recommendation to the state Society that in addition to the Range Week, a summer campaign on water heaters and a fall campaign on house heating be conducted. That this suggestion will no doubt be followed is the opinion of leaders in the Gas Appliance Society.

HOT-N-KOLD CORP. GETS RESULTS WITH RADIO ADVERTISING

Whether or not radio broadcasting pays, we are willing to leave to the experience of the individual who practices that particular form of advertising. The Hot-N-Kold shop of San Francisco, however, which has been using the air extensively during the past year, reports one incident which would seem to indicate that the radio audience is a confident and trusting one. A would-be purchaser from somewhere in the neighborhood of Salt Lake City, recently wrote to the Hot-N-Kold shop, care of the radio broadcasting section, asking the proprietors to "send me one of those Hot-N-Kold machines, something around $300.00." Whether he wanted a gas range, electric refrigerator, a radiant type heater, or floor furnace, he did not consider it necessary to divulge. Jack Douglas, vice-president of the corporation, feeling that possibly the Utah prospect had hopes of securing an apparatus that would be a combination of all of these species of domestic equipment, was obliged to pass up the order for the time being.

JAMES HENDERSON NOW HAS HILO GAS CO. CONTROL

James Henderson, manager of the Hilo Electric Light Company of Hilo, Hawaii, since February, 1923, early in February, became owner of the controlling interest of the Hilo Gas Company.

Since starting operations the company has extended its gas lines to serve Waiakea homesteads and houselots, Kapiolani tract, Piihouna and Wainaku. P. C. Beamer has been president of the company since its organization in 1917.

J. J. HARPER NAMED HEAD OF WESTERN NATURAL GAS CO.

Western Natural Gas Company, with headquarters in Anaconda, Montana, has elected as president, at a recent meeting of the stockholders, Mayor J. J. Harper of Anaconda. The company has five gas wells developed, and 12,000 acres under lease for gas development. A. W. Patterson, who was elected general manager, says that it is the intention of the company to pipe gas to Great Falls for commercial purposes in the spring.

Montana's Natural Gas Production Shows Substantial Increase

IN ITS LATEST compilation of information on Montana resources, the Montana Department of Agriculture, Labor and Industry, Publicity Division, incorporates the following material on natural gas. A. H. Bowman, commissioner, and Barclay Craighead of the Publicity Division, directed publication of the "Resources and Opportunities Edition" of the state publication "Montana" from which the paragraphs below are selected. J. P. Rowe, professor of geology, State University, Missoula, Montana, contributed the chapter quoted.—EDITOR.

MONTANA bids fair to become rather a large producer of natural gas. At present there are a number of localities in the state where gas has been struck but not yet used in a commercial way. Natural gas is a great boon to those in Montana who have it accessible. The heat value of natural gas and artificial gas is more than two to one in favor of the natural product. The matter of price is also a big factor. The city of Billings pipes its natural gas about 68 miles and sells it for 50 cents per thousand cubic feet, as against $2.20 per thousand paid for artificial gas at Missoula.

At present there are nearly a dozen cities in Montana using natural gas and about that many localities that produce natural gas in large enough quantities to be commercially valuable. The following are some of the cities using natural gas:

GLENDIVE-BAKER STRUCTURE
(Cedar Creek Anticline)

GLENDIVE—Gas was discovered and used in this city for the first time in 1913. Glendive also has the distinction of being the first city in Montana to use commercially natural gas. The wells are on the northern end of the Cedar Creek Anticline. One or two steps have been taken to pipe the gas from Glendive to Sidney and then to Williston, N. D., but nothing definite has as yet been done.

BAKER—The gas field located in the vicinity of Baker is called the Glendive-Baker structure, and consists of a series of six domes starting at a point about nine miles south of Glendive and running to a point about 30 miles south of Baker, or a total distance of about 65 miles. The names of the six domes, from north to south, are Ash Creek Dome, Cabin Creek Dome, Baker Lookout Dome, Hidden Water Dome, Little Beaver Dome, Fox Hills Dome, and Gallop Creek Dome. This field is recognized as one of the largest existing natural gas fields in the United States.

Gas was first discovered at Baker about 15 years ago when it was encountered in the drilling of a water well near there. Since its discovery the residents of Baker have been using natural gas and the Carbon Black Company was erected at Baker and has been using the gas at the rate of four million cubic feet per day for the past 13 years.

The development of the gas field by the Minnesota Northern Power Co. started two years ago and most of the drilling to date has been on the Cabin Creek Dome which has produced the largest wells so far on the Glendive-Baker structure. The Minnesota Northern Power Company now has 10 producing wells on the Cabin Creek Dome with an open flow capacity of over 100 million cubic feet. The Minnesota Northern Power Company has also drilled two wells on the Hidden Water Dome in the vicinity of Marmarth, North Dakota, these wells being of smaller capacity than those of the Cabin Creek Dome.

The Johns-Hagen Company has drilled several wells on the Ash Creek Dome and are continuing their drilling operations this year.

During the summer of 1926 the Minnesota Northern Power Company built a 40 mile 8-inch pipe line from the Cabin Creek Dome into Glendive, Montana, and has been serving Glendive with natural gas service since that time, as well as using natural gas in the power plant of the Montana-Dakota Power Company located at Glendive.

In the summer of 1927 an 8-inch pipe line was built from the Cabin Creek Dome through Terry, Montana, to Miles City, and natural gas has been distributed in those two towns since the 15th of August, 1927. During the same summer a 4-inch pipe line was built from the Hidden Water Dome into Marmarth, North Dakota, where gas has been distributed since October, 1927.

Development for 1928 consisted of a pipe line running south out of the field into the principal towns in the Black Hills of South Dakota. This is a 12-inch line and the towns served are Rapid City, Belle Fourche, Sturgis, Spearfish, Lead, Deadwood, Whitewood, Piedmont, Blackhawk and Tilford. This work was completed under the supervision of the Hope Engineering and Supply Company. Gas was delivered in Belle Fourche about August 1st, and the entire project to serve all of the Hills towns was completed by November. This development represents about 175 miles of main line and about 250 miles of distribution lines and an investment of about three million dollars.

Upon completion of this year's project, gas was distributed to a population of proximately 50,000 people. All of the distribution of natural gas from this field with the exception of the gas used at Baker, Montana, is distributed by the Minnesota Northern Power Company and its subsidiaries, the Montana-Dakota Power Company and the Black Hills Utilities Company.

The Montana-Dakota Power Company has made application to the State Utility Commission of North Dakota for a permit to build a gas line east from the field through the towns along the route of the Northern Pacific to Fargo, and, in anticipation of the construction of this line, the Company has purchased the artificial gas plants at Mandan, Bismarck, and Valley City. It is expected that construction on the line east from the field will start during 1929.

The gas from the Glendive-Baker structure tests approximately 1,000 B.t.u. per cubic foot and is a dry gas. The rates charged for the gas in the various towns range from 85 cents top to 20 cents, and the consumers are finding that the use of natural gas is a great convenience and in most instances is cheaper than the use of coal.

The developments that the Minnesota Northern Power Company and its subsidiaries have made in the vicinity of the gas field represent an investment of approximately six million dollars to date, and the developments in the next few years will probably double that amount.

Havre is the second city in the state to use natural gas. The gas comes from the

Eagle sandstone or from the base of the Montana formation. Recently Havre was connected by a pipe line to the Bowes structure in Blaine county.

Billings at present does not get its gas exactly from Montana, but it comes from Elk Basin, and as this structure is partially in Montana, it might be said that Billings gets its gas partially from Montana territory. The gas is piped 68 miles and, in addition to Billings, the towns of Bridger, Laurel, and others are also supplied. Billings might be able in the near future to secure her natural gas from the Big Lake district, as there are several producing gas wells already drilled in this structure.

Shelby and several other small towns in the northern part of the state use natural gas supplied from wells in the Kevin-Sunburst field. There are listed to date 105 producing gas wells in this field.

Great Falls is using gas piped from the Sunburst structure, which is in township 32 north, range 1 west.

In a recent report by G. G. Howard, chief geologist for Sunburst Oil and Refining Company, he states that the gas pool in the southern part of the Sweetgrass Arch (Sunburst field) covers approximately 55 square miles with an average depth of 1350 feet to the gas sand. In addition to this field, there are several others of great value in the production of natural gas. Mr. Howard sums up his report in the following paragraph:

"Wells drilled in the Sunburst Field are capable of producing some 94,500,000 cubic feet of gas per day, insuring an ample amount for all forms of consumption in such a city as Great Falls with an estimated peak of 15,000,000 feet. The Sunburst Field alone contains enough gas to give a 20-year supply to Great Falls, amply justifying the expense of a gas line to that city. Outside of the Sunburst Field there are available gas fields sufficient, with the Sunburst Field, to supply gas at the rate of 15,000,000 cu. ft. per diem 100 per cent recovery, for several generations. These fields are so located that they can be economically exploited by one trunk line, either direct to the Sunburst Field from Great Falls, with feeders from other fields, or going straight north from Great Falls through Galata, which is directly north of Great Falls, or through Chester, with a feeder line from the Sunburst Field, and the Grandview Structure. There are several small folds within the territory embracing from four to five square miles of reservoir capacity, which have not been considered in this report but are available for gas production and are easily tapped from the main trunk line.

TABLE OF CAPACITIES

Sunburst Field	200,000,000,000
Grandview Fold	365,000,000,000
Bingham or Reserve Fold	124,000,000,000
Flat Coulee Dome	100,000,000,000
Pinhorn Dome	294,000,000,000
Bears Den Structure	52,000,000,000
Government Creek Structure	74,000,000,000
Strode Structure	52,000,000,000
Utopia Dome	74,000,000,000
Total Cubic Feet	1,325,000,000,000

Many other structures in Montana such as Big Lake and others give much promise in the way of natural gas for Montana. Great Falls is now using natural gas. Then comes Helena, then Butte, and Anaconda, and finally Missoula. In less than a decade Montana's big cities will all be using Montana's natural gas.

Mid-West Gas Association Plans April Meeting

PROGRAM plans for the forthcoming convention of the Mid-West Gas Association, to be held in Minneapolis, Minnesota, April 15, 16 and 17, are going forward rapidly, according to Louis Stein, president of the organization. Headquarters for the meetings will be at the Nicollet Hotel.

Emphasis in the program features will be on load building, according to President Stein. Although some details remain to be definitely formulated, arrangements have already been made with the following to appear on the speaking program:

Major Alexander Forward, managing director, American Gas Association.

George E. Whitwell, The Philadelphia Co.—"Increase of Domestic Gas Consumption."

H. A. Groth, Wm. H. Rankin Advertising Co.—"Advertising."

Prof. H. B. Dorau, Northwestern University—"A Merchandising Program for The Gas Industry."

J. C. Miles, Warm Air Furnace Co.—"Forced Air Heating."

Roy W. Johnson, Time-O-Stat Company—"Automatic Controls."

Dr. D. C. Goudiss—(Subject not yet announced).

Entertainment is in the hands of J. K. Swanson, vice president and general manager of the Minneapolis Gas Light Company. Some unusual features are promised in this connection.

Roy B. Searing of the Sioux City Gas and Electric Company, Sioux City, Iowa, has been appointed as secretary and treasurer of the Mid-West Gas Association to fill the vacancy created by the resignation of A. W. Schmitt.

FT. WORTH GAS CO. REPORTS $100,000 INCREASE IN 1928 SALES

Forth Worth Gas Company, of Ft. Worth, Texas, carried on a program of expansion during 1928 which called for an expenditure of $726,186.10, representing an increase of nearly $100,000 over the amount expended during the previous year. Over 30 miles of gas distribution lines were laid in 1928. Total gas sales for the year showed an appreciable gain over 1927, with 8,601,616,000 cu. ft. being sold.

The addition of a new warehouse and shop costing $75,000 was an important item in the year's expansion program.

Construction of a new office building is the largest single item of expense included in the appropriation for 1929, the amount being $300,000.

MANAGERS NAMED FOR N. W. CITIES GAS CO. OFFICES

Walla Walla, Washington, will be the headquarters of the Northwest Cities Gas Company, which bought the gas distribution lines of the Pacific Power & Light Company of Portland, Oregon. The latter company formerly owned and operated the gas systems in Walla Walla, and Yakima, Washington; Pendleton and Astoria, Oregon; and Lewiston, Idaho. H. M. Thomas of Walla Walla has been named general manager of the Northwest Cities Gas Company for which the Union Utilities of New York is the holding company.

The following have been named to the managership of the local offices: I. C. Hockett, Yakima; J. P. O'Neil, Astoria; Thomas L. Cross, Lewiston; and R. S. Gaut, Pendleton. The Walla Walla manager has not yet been named.

ROPER CORPORATION ISSUES SALES DATA AND MEMO BOOK

The Geo. D. Roper Corporation has recently issued a vest pocket size Sales Data and Memo Book to aid gas company floor and house-to-house salesmen to a better understanding of the company's products.

Included in this 48-page booklet is a typical sales canvass, giving examples on how to approach a prospect, conduct the sales talk and demonstration, and how to close the sale. There is also space for the salesman's record of his daily, monthly, and yearly sales, a space for addresses and memoranda. A complete table of dimensions and information regarding every gas range model manufactured by the Roper Corporation, makes the manual useful to a gas range salesman.

ACETYLENE PLANTS SOLD TO PREST-O-LITE COMPANY

On January 1, 1929, The Prest-O-Lite Company, Inc., acquired the business of the Acetylene Products Company, which operates two acetylene producing plants located respectively at 401 E. Buchanan street, Phoenix, Arizona, and at 914 Texas street, El Paso, Texas. Everett R. Kirkland is superintendent of the Phoenix plant, and Carl F. Chesak is superintendent of the El Paso plant. R. G. Daggett, whose headquarters are at the San Francisco office, is district superintendent.

HOT-N-KOLD CORP. OF CALIF. IN NEW S. F. QUARTERS

The Hot-N-Kold Corporation of California has recently moved its main office from 949 Mission Street to the building which has been housing the Hot-N-Kold shop of San Francisco at 417 Sutter Street. The last named address is in the neighborhood that is considered very advantageous for retail gas activities.

A change in the management of the Fresno office finds Charles Meredith, formerly of San Francisco, in charge of this branch replacing L. Kramer who recently resigned.

JOPLIN GAS CO. GIVES GAS APPLIANCES AS PRIZES

At the formal opening of the new headquarters of the Joplin Gas Company of Joplin, Missouri, held on February 12-16, bread toasters were given away to the first 2500 ladies who registered for a drawing at which a gas range and heater were the prizes. Ed Pfenning is manager of the Joplin Gas Company and W. E. Carden, new business manager. The formal opening of the new Neosho Gas Company was celebrated about the same time. Natural Gas was turned into St. Joseph mains on January 14th through the line construction from Leavenworth, Kansas, by the Cities Service Gas Company.

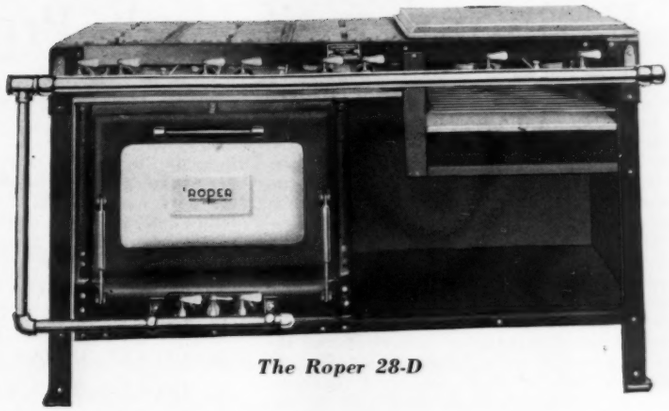
CHAS. R. COLLINS ASKS RENEWAL OF AUBURN, WASH. FRANCHISE

Charles R. Collins of Seattle has asked for a renewal of the gas franchise which he secured in Auburn, Washington, some time ago. It is planned to pipe gas from Tacoma to the towns of Auburn, Kent, Sumner, and Pacific. Kent has already granted a franchise to Mr. Collins.

W. W. HILL OF KANSAS CITY GAS CO. TRANSFERRED TO LA.

W. W. Hill, househeating engineer of the Kansas City Gas Company has been transferred to Shreveport, Louisiana, where he will be associated with the Arkansas Natural Gas Company.

Almost-- It Sells Itself.



The Roper 28-D

Here Is a Range that is its Own Sales Talk

Built for a definite purpose the 28-D fits right into the picture of the smaller restaurant or short order house and your big hotel kitchens, even those using solid fuel, need the 28-D for their off-peak loads.

It is easy to talk about—easy to understand—easy to sell. For instance: A three section open top with three giant burners and three regular burners— a two section griddle top heated by two loop burners—toaster and broiler underneath the griddle heated by the same two burners—the whole top equipped with "Touch-A Butto.." lighters—an oven 22 by 19 by 14 inches, built to stand the hardest use and abuse—Roper Complete Oven Control to save the chef's time.

Like most of the Roper line, one 28-D can be operated by itself or as part of a battery of two or more units. One, two or all of the open sections can be converted to closed tops.

And 28-D has that great family characteristic of all the Roper line—economy of operation. But if your prospect has been around much he probably knows that already.

ROPER

TRADE MARK REG.U.S.PAT.OFF. REG. IN CANADA

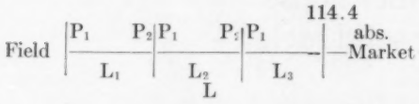
GAS RANGES
GAS FURNACES

Geo. D. Roper Corporation, Rockford, Ill. Pacific Coast Branch 135 Bluxome St., San Francisco

Economics *of* High Pressure Transportation

(Continued from Page 22)

Let us set up a design for a pipe line 500 miles long, with a capacity of 150,000 M. c.f. per day. We may have three sections, four sections or five sections. In any event assume that the pressure at the market end is 100 pounds and that the number of compressions at the line station is 2.5 so that in all sections except the last the expansion ratio in the pipe line is 2.5. These conditions require about 54 H. P. per million cubic feet of gas compressed and make the square root of the difference in squares of the absolute pressures equal to about .915 P_1. At 10 cubic feet per H. P. hour fuel consumption at the line stations there will be required, allowing for auxiliary plant fuel about 250 feet per H. P. day or at 54 H. P. per million 13,500 cubic feet of fuel per million cubic feet of gas compressed. With this ratio of fuel to gas compressed and fixed pressure at the market, we may compute the lengths of the various sections of the line so that the flow may be balanced between sections. Consider first a line of 3 sections.



If X be the fuel used per cubic foot of gas compressed and Q the quantity in cubic feet per day delivered at the market, then the flow in section L_3 is Q, the flow in section L_2 is $Q + XQ$ or $(1 + X) \times Q$ and the flow in section L_1 is $(1 + X)^2 \times Q$. Then since the square of 114.4 is 13087 we may write the flow equations in the three section as follows, K being the coefficient for pipe size having the value,

$$K = 871 \times D^{3/6}$$

(1) $Q\sqrt{L_3} = K\sqrt{P_1^2 - 13087}$

(2) $Q(1+X)\sqrt{L_2} = K \times .915\, P_1$

(3) $Q(1+X)^2\sqrt{L_1} = K \times .915\, P_1$

(4) $L_1 + L_2 + L_3 = L$

Solving for the ratio of L_1 to L_2 by equating left hand of (2) and (3) and squaring and giving X the value of .0135.

(5) $$L_1 = \left[\frac{1+X}{(1+X)^2}\right]^2 \times L_2$$

(6) $$L_1 = \frac{L_2}{(1+X)^2} = .9735\, L_2$$

(7) $$L_2 = 1.0272\, L_1$$

(8) From (3) $$L_1 = \left(\frac{K\, P_1}{Q}\right)^2 \times \left[\frac{.915}{(1+X)^2}\right]^2$$

(9) From (1) $$L_3 = \left(\frac{K}{Q}\right)^2 \times (P_1^2 - 13087)$$

Dividing (9) by (8)

(10) $$L_3 = L_1 \times \frac{(P_1^2 - 13087)\,(1+X)^4}{(.915\, P_1)^2} = \frac{(P_1^2 - 13087) \times 1.2603}{P_1^2}$$

Substituting (7) and (10) in equation (4),

(11) $$L_1 + 1.0272\, L_1 + L_1 \times 1.2603\, \frac{(P_1^2 - 13087)}{P_1^2} = L$$

(12) $$L_1 = \frac{L}{2.0272 + 1.2603\left(\frac{P_1^2 - 13087}{P_1^2}\right)}$$

(13) $$L_1 = \frac{L}{3.2875 - \frac{16494}{P_1^2}}$$

In equation (13) we have a value of L_1 in terms of L. In equation (7) we have a value of L_2 in terms of L_1, L_3 may be obtained by difference. For lines of 4 sections and 5 sections similar equations may be derived, the succeeding sections having length ratios of $(1 + X)^2$ except the last. Thus for a four section line:

(14) $$L_1 = \frac{L}{4.3768 - \frac{16944}{P_1^2}}$$

(15) $L_2 = L_1 \times 1.0272$

(16) $L_3 = L_1 \times 1.0551$

L_4 May be obtained by difference.

For a 5 section line:

(17) $$L_1 = \frac{L}{5.4957 - \frac{17400}{P_1^2}}$$

(18) $L_2 = L_1 \times 1.0272$

(19) $L_3 = L_1 \times 1.0551$

(20) $L_4 = L_1 \times 1.0838$

The length of sections for lines of 3, 4 or 5 sections at various initial pressures is then as per Table II. The length of the last section in each case fixes the capacity, since we have made allowance for fuel in fixing the length of the preceding sections, using the same diameter throughout. The value of the pressure function in the last section with an outlet pressure of 100 pounds gage is shown in Table III. From the lengths of last section in Table II and the pressure function in Table III we may compute for a capacity of 150,000,000 cubic feet per day the size of line required for various pressure conditions as per Table IV. Having found the diameter, the weight in tons per mile may be determined from the equation:

TABLE IX
ANNUAL OPERATING EXPENSES AND CHARGES

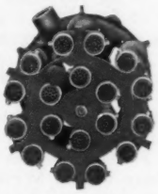
500 MILE PIPE LINE—150,000 M C F PER DAY

	Dollars Per Year		
	3 Sections	4 Sections	5 Sections
300 lb. Line 12500 lb. Stress			
15% on investment	3,917,194	3,801,469	3,649,838
Management and General	100,000	100,000	100,000
Compressor Stations	222,170	322,850	424,780
Line, Patrol and Opr.	75,000	75,000	75,000
Total Per Year	4,314,364	4,299,319	4,249,618
300 lb. Line 15000 lb. Stress			
15% on Investment	3,412,434	3,276,469	3,237,338
Management and General	100,000	100,000	100,000
Compressor Stations	222,170	322,850	424,780
Line, Patrol and Opr.	75,000	75,000	75,000
Total Per Year	3,809,604	3,774,319	3,837,118
400 lb. Line 12500 lb. Stress			
15% on Investment	4,073,025	3,906,131	3,841,350
Management and General	100,000	100,000	100,000
Compressor Stations	245,280	346,270	448,520
Line, Patrol and Opr.	75,000	75,000	75,000
Total Per Year	4,493,305	4,427,401	4,464,870
400 lb. Line 15000 lb. Stress			
15% on Investment	3,545,025	3,440,381	3,412,350
Management and General	100,000	100,000	100,000
Compressor Stations	245,280	346,270	448,520
Line, Patrol and Opr.	75,000	75,000	75,000
Total Per Year	3,965,305	3,961,651	4,035,870
500 lb. Line 12500 lb. Stress			
15% on Investment	4,241,888	4,061,981	3,804,938
Management and General	100,000	100,000	100,000
Compressor Stations	264,540	365,790	468,830
Line, Patrol and Opr.	75,000	75,000	75,000
Total Per Year	4,681,428	4,602,771	4,448,768
500 lb. Line 15000 lb. Stress			
15% on Investment	3,686,138	3,567,731	3,380,438
Management and General	100,000	100,000	100,000
Compressor Stations	264,540	365,790	468,830
Line, Patrol and Opr.	75,000	75,000	75,000
Total Per Year	4,125,678	4,108,521	4,024,268

The Pacific Announces a New Line

of Unit Gas Furnaces Approved by the American Gas Association

This furnace is round instead of square. As a result there are no corners and no dead air spaces. There is better circulation because of the absence of corners. Consequently, heating is accomplished more quickly. The heating element is completely welded throughout, is gas tight, and permits no combustion fumes to escape. The heating unit is of 20-gauge pure Ingot Iron Toncan metal, known for its rust resisting qualities.



Pacific has devoted years to the development of this new furnace which now carries the BLUE STAR OF APPROVAL. Back of this approval is our 15 year old reputation as the leading and largest gas heating organization in the West.

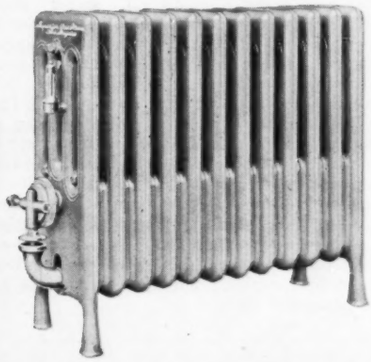
New Multi-Tubular Burner

Each burner has its independent injection of gas. Primary air for combustion is directly siphoned at each individual burner. There is no need for adjusting of the gas and air for combustion as this new Pacific Burner is scientifically designed to automatically give the correct proportion of air to gas. This results in complete combustion and a high temperature flame of proven economy. No soot. No odors.

Pacific Unvented Gas Steam Radiators Also Approved

By selling the Complete Pacific Line You Have the Advantage.

Because with the complete Pacific line you can offer the correct solution to every heating problem. Where other heating salesmen stress their particular appliance, our agent selects from a full line the appliance best suited. We have a real money making proposition. Write for particulars.



And NOW, Pacific Unvented Gas Steam Radiators, furnished in 4 column pattern 26, 32 and 38 inches high, carry A. G. A. BLUE STAR SEAL OF APPROVAL. In addition to this approval, the Pacific Gas Steam Radiators are approved by the Underwriters' Laboratories.

Pacific Gas Radiator

Gas Heating **Company** *Headquarters*

Roseberry and Walter Streets, Huntington Park, California

MANUFACTURERS *of* EVERY TYPE *of* GAS HEATING APPLIANCE

$$(21)\quad W=\frac{3.1416\times 12\times D^2\times P\times .2833\times 5280}{2\times 5\times 2000}$$

$$(22)\quad W=\frac{14.093\times D^2\times P}{S}$$

The weights so calculated for a 500-mile line are given in Table V.

Cost of Pipe Line

At the present time pipe prices in the Southwest are about $90.00 per ton delivered. They vary somewhat with diameter and also with weights in each diameter, the thin wall pipe in any size costing somewhat more than heavy wall. There is no exact ratio of these relative costs and for present purposes $90.00 per ton plus $1.00 per ton per inch over 17 inches or under 11 inches is assumed, using the nearest even inch of inside diameter, for pipe of 12,500 pound allowable tensile stress with $1.00 per ton additional for pipe of 15,000 pounds allowable tensile stress. The costs per ton are shown in Table V. There are certain parts of the cost of installation that are proportional or nearly so to the weight of material. Among these are unloading and stringing, laying, joints, (whether coupled or welded) valves and fittings and setting of same, miscellaneous freights, special work, superintendence and equipment charges. These all amount to about $32.00 per ton for an average job.

In addition there are certain costs which are proportional to the diameter of the pipe, in which are included painting, ditching, backfilling, and cleaning up. These amount to about $122.50 per mile per inch of diameter.

The costs which are independent of pipe size or weight are right of way, surveys, damages, clearing, and telephone line, amounting to from $600.00 per mile to $1,100.00 per mile, depending on the class of territory. It will be assumed at $900.00 per mile.

Summarized, these costs may be expressed by an equation which will include 15 per cent for overhead, interest during construction and contingencies.

$$\text{Cost}=L\times(1035+36.80\,W+CW+140.80\,D)$$

Where L is length in miles,
W is weight in tons per mile,
D is inside diameter in inches,
C is price per ton of pipe.

In Table VIII is shown a compilation of costs for the 500-mile line for 150,000 M. c. f. per day capacity based on 3, 4, and 5 sections and at two different stresses in pipe walls, 12,500 pounds and 15,000 pounds.

Cost of Compressor Stations

Since the quantity to be compressed is the same in all cases except for compressor station fuel, and the ratio of compression is the same at all stations except field station requiring 54 H. P. per million feet compressed, we may compute the installed horse power at each line station at 60 H. P. per million compressed, which will allow for spare units. Assuming a field pressure of 250 pounds at inlet to field station, the horse power requirement per million for that station are as per Table VI. The quantity to be handled at each station includes fuel for all succeeding stations and allowance has been made for this. The H.P. per station and cost of station is shown in Table VII.

Total Cost of Project

The total cost of the pipe line project, including line and compressor stations, is shown in Table VIII. Since the cost of pipe line increases with pressure and the cost of compressor stations increases with pressure, the total cost increases with pressure and there appears to be no advantage so far as investment is concerned from the higher pressures except in those special cases where the utilization of a higher pressure will avoid the selection of a pipe size so large as to entail excessive costs per ton and in those cases where the minimum wall thickness required for rigidity in handling or for successful manufacture allows a higher pressure without increase of tonnage of steel.

Compressor Station Spacing

It may be noted that the investment as between a three-section, four-section or five-section line is progressively reduced at all pressures as the number of sections increase. We may well inquire whether the operating expenses and charges follow the same trend and will investigate only the 300-, 400-, and 500-pound designs in this connection. Certain of these charges are proportional to the investment approximately as follows:

Interest	7.70%
Amortization, 15 years, 6% S. F.	4.30%
Taxes	1.50%
Maintenance and reserve	1.50%
	15.00%

Unaccounted-for gas will likely be about the same for any of the conditions and will be neglected. The expense of management will amount to a fixed sum of about $100,000.00 per year for all conditions. Compressor station operating expense, including fuel for 65 per cent Load Factor at 7c per M. c. f., may be taken at $8,000.00 per station per year plus $10.00 per installed H.P. The work of line patrol, meter reading and ordinary operation of line will be practically identical at about $150.00 per mile for all conditions or $75,000.00 per year. The respective operating expenses and charges are then as per Table IX. This may be interpreted that close spacing of compressor stations is to be justified only to avoid use of a pipe size so large as to entail excessive costs per ton or to defer till the markets develop the investment ultimately required to be made. This conclusion might be somewhat modified if a design were made based upon a lower number of compressions at the line stations, but space and time has not permitted this.

Good Increase Shown *in* Cities Service 1928 Sales

THE total appliance and installation sales of the combined new business departments of The Gas Service Company in 1928 were $2,121,286.00, an increase of 7.3 per cent over 1927, when the total appliance and installation sales amounted to $1,911,187.

Appliance and installation sales for all departments were $11.02 on a customer basis for 1928 as compared with $10.45 on the same basis for 1927.

The new business departments, under the leadership of F. M. Rosenkrans, new business manager, continued the policy in connection with their activities of adding to the company lines, gas equipment which would promote more rapidly the building up of the gas load. Major attention was given to the promotion of house heating in all of the companies.

A total of 2,830 central house heating installations were sold during 1928. The type of equipment included in the above house heating installations sold were 560 gas designed boilers and furnaces and 2,270 conversion burners. For the replacement of coal stoves, base burners and similar heating apparatus, 2,801 units of large capacity enclosed and vented space heaters were sold.

The increase in total domestic revenues for the year of 1928 over 1927 was 6.9 per cent and the cubic feet sales for domestic purposes show an increase of 7.1 per cent.

Industrial gas sales and revenues show an unusual increase over the preceding year due to the sale of large amounts of gas under industrial contracts which were made during the year subsequent to increases in the supply.

The domestic M.c.f. sales per customer for the company as a whole increased during the year from 62.9 to 65.8 and the annual revenues per customer were increased during the year from $51.70 to $54.01.

A total of 5.360 customers were added in companies where new business departments operate, which is an increase of 3.1 per cent over the preceding year.

There were five new business departments which exceeded $15.00 in merchandise sales per customer. The high record of the group was again made by the Western Distributing Company at El Dorado, Kansas, under the leadership of Walter Cary. This department has had the distinction of leading the others for a number of years, holding the high record in the amount of gas equipment sold per customer. This year this department had total sales of $25.97 on a customer basis. The Newton Gas Company, with L. L. Garner as manager and new business manager, ranked second in merchandise sales with sales amounting to $19.18 on a customer basis which is a new high record for this organization. Other departments which exceeded $15.00 in sales on a customer basis are those of the Western Distributing Company at Augusta, Kansas, the Consumer's Gas Company at Miami, Oklahoma, the Wichita Gas Company, the Joplin Gas Company, and the Capital Gas and Electric Co. at Topeka.

The number of appliances sold by the new business departments totaled 29,351, which include domestic and house heating appliances and equipment sold to the hotel and restaurant, commercial and industrial institutions. Of the 16,690 domestic appliances sold, the principal items were 10,829 gas ranges, 1,883 automatic storage water heaters, and 383 cookers and hot plates, in addition to a large amount of other miscellaneous domestic equipment.

With a great increase in the supply of gas made available during the year a large amount of work was done by the Gas Service new business departments in securing large industrial contracts. Much work was done with hotels and restaurants, and in all of the cities served by the company, bakeries, with few exceptions are now using gas exclusively for fuel.

A total of 214 hotel and restaurant appliances were sold; these include 35 bake ovens; 6 broilers; 144 ranges, 11 griddles; 7 steam tables; 9 toasters; 30 large capacity storage water heaters and much small equipment.

In connection with the industrial phase of the business, 230 large industrial burners and 366 small industrial burners were sold to industrial consumers. The total number of industrial appliances of all descriptions sold was 845.

The increase in annual consumption brought about by the sales of these appliances will amount to approximately 833,214 M.c.f.

A-B
BATTLE CREEK

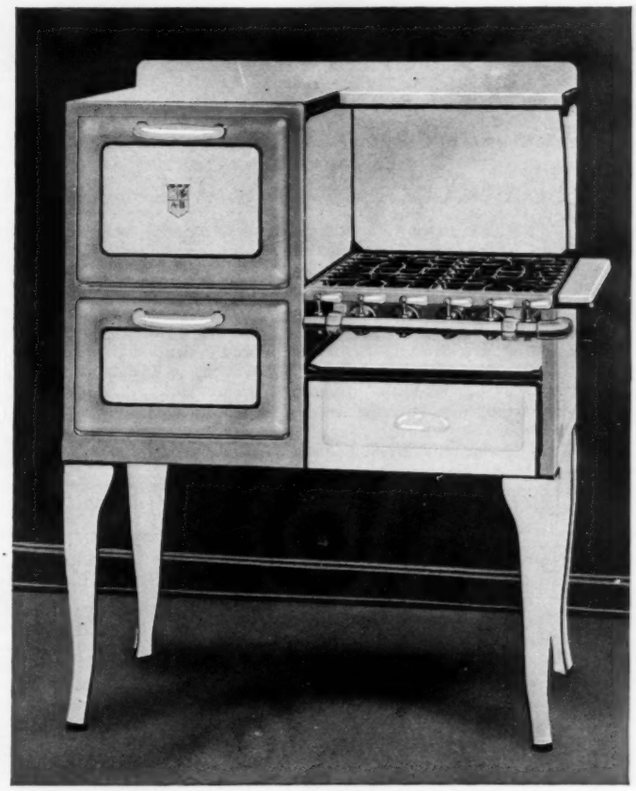
Announces

The 900 Series

A NEW, STURDILY CONSTRUCTED QUALITY GAS RANGE IN THE MODERATE PRICE FIELD

TESTING LABORATORY AGA APPROVED

Like all the numbers of the A-B line, the 900 Series is built strictly to specifications of the American Gas Association Laboratories and carries the Blue Star Approval Seal.



LET US SHOW YOU HOW THE 900 SERIES WILL INCREASE YOUR GAS RANGE SALES.

WRITE OR WIRE FOR FULL PARTICULARS

A-B STOVE COMPANY, - Battle Creek, Michigan

Contestants and judges in Boy Scouts' biscuit-baking contest at Centralia, Washington. F. W. Schwab, division manager of the Washington Gas and Electric Company sponsoring the contest at Centralia, is the gentleman wearing glasses in the rear row.

Boy Scout Cooking Contest Wakes Keen Rivalry

"Moth--er! What'll I do now?" changed to "Lookee, Mum, this's keen!" among the entrants in the Boy Scout's biscuit baking contest which took place February 9, under the auspices of the Washington Gas and Electric Company, in its office at the corner of Magnolia and Pearl Streets, Centralia, Washington.

According to F. W. Schwab, division manager for the company, interest in the competition was rife in Centralia for two weeks before the event. The contestants' families had been eating biscuits, terrible ones, good ones, hard ones, scorched ones, soggy ones, fluffy ones, progressing through the painful stages of development, until glorious perfection had been reached at last.

Twenty-one Boy Scouts were entered in the contest, which was conducted in two divisions,—one for all Scouts of first class or higher grade, and the other for tenderfoot and second class Scouts.

The Washington Gas and Electric Company is contemplating two other contests, one in which the six winners of the Boy Scout match challenge six ladies from the Civic Club. A similar biscuit baking tournment is being planned for the Camp Fire girls.

SIXTH ANNUAL METER SHORT COURSE OPENS APRIL 16

The general committee sponsoring the Sixth Annual Gas Meter Short Course, met at the Engineering Building of the University of Oklahoma January 30 and selected April 16, 17 and 18 as the dates for the 1929 course. The committee includes representatives of the University College of Engineering, the Oklahoma Corporation Commission, the Oklahoma Utilities Association and manufacturers of gas measuring appliances. The committee voted to invite the natural gasoline manufacturers of the state to name two representatives for committee membership. F. D. Frank of Bartlesville is chairman of the general committee. Subcommittees will be headed as follows: Program, D. A. Sillers, Dallas; banquet and entertainment, W. H. Carson, Norman; exhibits, C. B. Day, Oklahoma City, publication of proceedings, F. C. Walters, Tulsa; approved methods, C. W. Robbins, Blackwell; publicity, registration and housing, E. F. McKay, Oklahoma City. It is expected that last year's registration of 300 will be exceeded this year.

A. G. A. ACCOUNTANTS TO CONVENE MARCH 21

Meeting for the first time in formal conference, the Accounting Section of the American Gas Association will convene on March 21 and 22 at Chicago, Illinois. Edward Porter of Philadelphia has been appointed chairman of the committee which has charge of the arrangements.

NEW SHOWROOM OPENED IN FOOTSCRAY, VICTORIA

A new showroom of the Colonial Gas Association, Ltd., of Australia, was opened recently at Footscray, a suburb of Melbourne, Victoria. The display room has been attractively fitted out, with the new appliances in a setting which shows them to the best advantage. Visible from the street is an alcove which features a colored gas stove, an automatic water heater, and a gas refrigerator. In another alcove is a model bathroom, and in still another is a living room fitted with a radiant heater.

NEW NATURAL GAS RATES FOR GALVESTON, TEXAS

An ordinance was passed on February 7th by the board of commissioners of Galveston, Texas, adopting the following domestic rates for natural gas service in that city: 85 cents for the first 3,000 feet; 80 cents for the next 5,000 feet; 77½ cents for the next 7,000 feet and 65 cents for all in excess of 15,000 cubic feet.

SEVERAL TEXAS TOWNS TO HAVE NATURAL GAS

A gas pipeline is now being laid by the Moran Gas Corporation from White Point, Texas, to the Humble Oil & Refining Company at Ingleside. This line will be carried on to Aransas Pass, and a branch line will serve Gregory and Portland. La Quinta will receive gas through an extension from the Ingleside-Aransas Pass line.

UTAH NATURAL GAS PROJECT GETS UNDER WAY

Affiliated interests in the project to bring natural gas from Baxter Basin, Wyoming field, to Salt Lake City and vicinity are pushing this major project to completion with all possible speed. Construction of the line, started early in January, was delayed during early February by blizzards and snowstorms, but greater progress is now being made. One hundred and fifty men have been added to the payroll of the Western Public Service Corporation since the beginning of the work.

Vernal and Farmington, as well as Weber County, Utah, have added their approval to the nautral gas project by granting franchises for the service of natural gas to the Washtach Gas Company, subsidiary of the Western Public Service Corporation.

A new company has been organized which will have charge of gas production and be under the direct management of officials associated with the Ohio Oil Company. The new company, to be known as the Mountain Fuel Supply Company, will have headquarters in the Rock Springs National Bank. The Ohio Oil Company has turned over all of its operations on Hiawatha Dome and in the Baxter Basin district to this company.

SOUTHERN UNION GAS COMPANY COMPLETES EXTENSIONS

The Southern Union Gas Company of Dallas, a subsidiary of the Murchison Oil Company has recently completed an extension of its line originating in the Winkler county, Texas, gas fields from Pyote through Barstow to Pecos, Texas. The line is also being extended from Pyote to Wickett and Monahans.

In South Texas this company is now completing a line from the Racoon Bend field in Austin County into Brenham, Texas, a distance of 18 miles, where it will supply gas to the Texas Cities Gas Company. From this same field the company expects to lay lines to Hempstead. Bellville and Kenney, where it holds gas franchises.

F. F. Murchison is president of the Dallas company; C. W. Murchison and E. M. Closuit, vice presidents, and K. Murchison, secretary and treasurer.

NORTHWEST TEXAS GAS COMPANY INCREASES CAPITALIZATION

With an increase in capitalization from $10,000 to $100,000, the Pease Valley Gas Company, recently incorporated under the name of Northwest Texas Gas Company expects to extend its gas system to additional cities.

The company, of which W. R. Stinnett of Vernon, Texas, is president and founder, now supplies gas to the cities of Rayland, Parsley Hills, Lockett, Farmer's Valley, Odell and Medicine Mound. The towns of Avoca, Leuders, McCaulley, Sylvester, Royston, and Tuxedo will be added to the system, it was said.

W. M. HOLLAND NAMED PRESIDENT OF BILLINGS GAS CO.

W. M. Holland of Casper, Wyoming, has accepted the post of president of the Billings Gas Company, of Billings. Montana, succeeding C. R. Hetzler who resigned that position to become vice-president and manager of the Mountain Fuel Supply Company, a subsidiary of the Ohio Oil Company. J. E. Moore is manager of the Billings Gas Company, being promoted from the post of superintendent.

Mr. Holland was formerly assistant to the general superintendent of the Rocky Mountain Division of the Ohio Oil Company.

A GRAND SLAM for January 1929

WE plead guilty. We know that an organization of our size—with our international connections—should announce this wonderful news with appropriate dignity,—lots of staid looking type and conventional ornaments. But today we just cannot do it. When—after putting lots of good work behind a good product, January sales come right back labeled "One hundred per cent increase over January, 1928"—we simply must permit a little justified enthusiasm to our Gas Water Heater Department.

To you—the event is scarcely of lesser importance because Welsbach Self Action Water Heaters can help increase your sales, too.

All Welsbach Water Heaters may be had with or without safety gas shut-off and temperature-pressure relief valve.

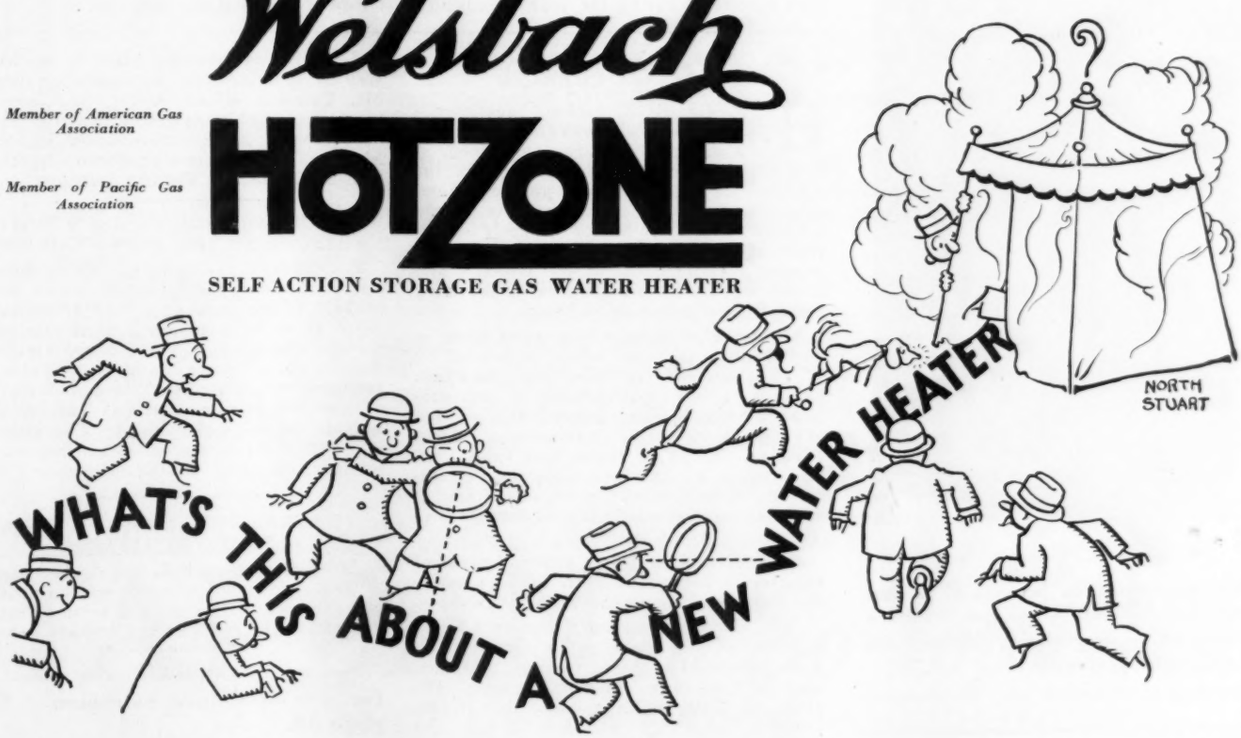
WELSBACH COMPANY, Gloucester City, N. J.

Member of American Gas Association

Member of Pacific Gas Association

Welsbach HOTZONE

SELF ACTION STORAGE GAS WATER HEATER



The STRICKLER

Ratchet Pipe Cutter

The STRICKLER Ratchet Pipe Cutter automatically cuts cast iron, steel and wrought iron pipe (from 1½ to 30" in diameter) by hand (either in the trench or in the shop).

You can cut any pipe from any position easily. Simply pump the handle and the STRICKLER does the rest. Order your STRICKLER Now

W. W. STRICKLER & BROS.

1475 Oak Street Columbus, Ohio

The Electrogas Cabinet

Will appeal to you because it is not only a rich piece of walnut furniture but is also a marvelously efficient gas furnace, fully vented.

ELECTROGAS FURNACE CO., San Francisco

So. Counties *to* Sign Its System *for* Air Travel

AN outstanding contribution to air travel was announced late in February by the Southern Counties Gas Company through F. H. Bivens, vice-president in charge of public relations and sales, and A. F. Bridge, vice-president in charge of operations. Properties of the company, including warehouses, horizontal high pressure holders, low pressure holders of the collapsible type and compressor stations throughout the entire Southern California system of the Southern Counties, from Santa Barbara to Newport Beach, are to be lettered with aviation signs which can be read from a height of several thousand feet.

This work already is under way, with paint crews busy on the roofs of the Ventura compressor station and warehouse. A number of these airway signs are to be floodlighted at night as an aid to night flying. Wherever possible the letters will be 20 feet in breadth. Some of the signs will be 150 feet long. They will designate the name of the city or town and arrows will point the way to the nearest airport.

These airway markings are being painted in conformance with the specification for such signs issued by the United States Department of Commerce. The project has been endorsed enthusiastically by the aeronautical committee of the California development Association, and the Guggenheim Fund for the Promotion of Aviation is taking a keen interest in this work of identifying Southern California cities and towns thus prominently on the new airway maps.

In a subsequent issue *Western Gas* will present aerial photographs of Southern Counties properties used in guiding airway travel through Santa Barbara, Ventura, Newport, Santa Ana, Orange, Anaheim, Santa Monica, Monrovia, Ontario, Pomona, and other points on the lines of this progressive gas utility.

Public Service Co. *of* Colo. *to* Spend $400,000 *in* 1929

AN increase of $540,000 in gross expenditure for maintenance and additions to the system of the Public Service Company of Colorado, during 1928, over 1927, indicates that the expansion program of that company covered a wide field. The amount appropriated in 1928 for expansion was $880,000.

Thirty-two miles of gas distribution lines were laid by the company during the year, and 973 independent meters were installed, bringing the total number of meters in the company's system to 80,879.

Total gas sales of the company in 1928 showed a slight decrease to 3,406,000 from the 3,650,894 in 1927, due to the fact that the company changed from manufactured gas of 335 B.t.u. content to natural gas of 875 B.t.u. content, with the consequent decrease in M.c.f. sales.

That the merchandising program of the Public Service Company of Colorado has been successful during the year is indicated in the number of gas appliances sold. Gas ranges to the number of 1847 were sold during the year; 997 storage automatic water heaters; 878 circulating water heaters; 919 space heaters; 2406 gas furnaces; 844 conversion burners and other special types; 336 pieces of laundry equipment, and 8 gas fired refrigerators.

The sum of $275,000 was spent on additions and maintenance of the distribution system of the company during 1928. Construction of a gas plant at Grand Junction cost $27,000. Expenditures incidental to changing over to natural gas from manufactured, including servicing customers appliances, and other construction and equipment, amounted to $491,000.

A total of $400,000 has been appropriated for additions to the gas system during 1929. This includes the natural gas extension to Englewood and Littleton, Colorado, together with additions and maintenance to the distribution system of the company.

SO. CALIF. GAS CO. ANNOUNCES PERSONNEL CHANGES

H. P. GEORGE, general superintendent of the Southern California Gas Company recently announced a number of promotions and changes in the personnel of the natural gas production and transmission system. Among these is the selection of E. Henderson, formerly supervisor of compressor stations, as assistant general superintendent of the system. Mr. Henderson has moved his office to the third floor of the distribution building.

A number of changes have been made in the Midway Division which is headed by W. C. Cameron, its new superintendent. Ralph L. Cook, superintendent of measurement for the division, assumes the position of superintendent of transmission, Basin Division. Ralph E. Haun goes from Ventura, where he has been assistant superintendent, to Taft to take up his new duties as assistant superintendent of the Midway Division under Mr. Cameron.

A. B. Newby, formerly superintendent of compressor stations at Taft, becomes assistant superintendent of the Midway Division.

J. A. Gendron, engineer, becomes division engineer of the Basin, while Grove Lawrence, technical engineer in the Taft office, goes to Ventura as division engineer. His place in Taft is being taken by H. M. Dwight.

Z. H. Bissell takes his place in the Midway as superintendent of production under Mr. Cameron. John Riegle, Jr., assumes his duties as assistant geologist at the Basin headquarters in the distribution building. M. D. Pfleider becomes production scout for both the Basin and Ventura divisions.

NATURAL GASOLINE ASS'N. WILL SUPPORT METER SHORT COURSE

F. D. Frank, chairman of the Southwestern Gas Meter Short Course, which is to be held at the state university at Norman, April 16 to 18, has been notified that at a director's meeting of the Natural Gasoline Association of America, held in Tulsa, a resolution was passed that the manufacturers of gasoline from natural gas endorse and support the gas meter school. The association will advertise the school and request its member companies to send their men.

CENTRAL ARIZ. L. AND P. BUYS TEMPE UTILITIES

At an election on February 5, the citizens of Tempe, Arizona, voted to sell the municipal gas and electric utilities to the Central Arizona Light and Power Company.

$50.00

for gas appliance salesmen. **See page 33.**

YOUR customer judges the value of gas service by the way her gas range performs.

A MODERN, well-constructed gas range makes satisfied customers and leads to installing other appliances.

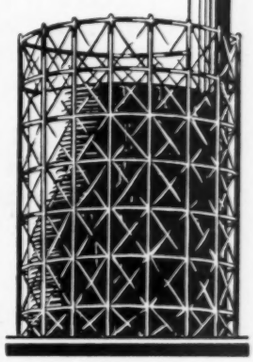
This INSULATED *range will help you build up your Domestic Load*

A LEADING gas company, through a house-to-house survey, finds that many appliances in customers' homes are not being used, or are used but little, owing to dissatisfaction. Usually the appliance itself is the trouble-maker. A worn-out, obsolete or inefficient gas range is the biggest obstacle any gas company can have to encouraging an increase in its domestic load.

On the other hand, when the Tappan In-So-Top Range goes into any home, it is insurance that gas sales to that customer not only will *continue* but will *increase.*

Insulated with rock wool, the Tappan In-So-Top brings new kitchen comfort and leads to increased baking. Insulation keeps heat *in* the oven and *out of* the kitchen.

Moreover, the investment made in this modern range insures its continued use for years to come. Write for details about the In-So-Top Range and our merchandising plans.



The Tappan In-So-Top Gas Range is now supplied with attractive color trims

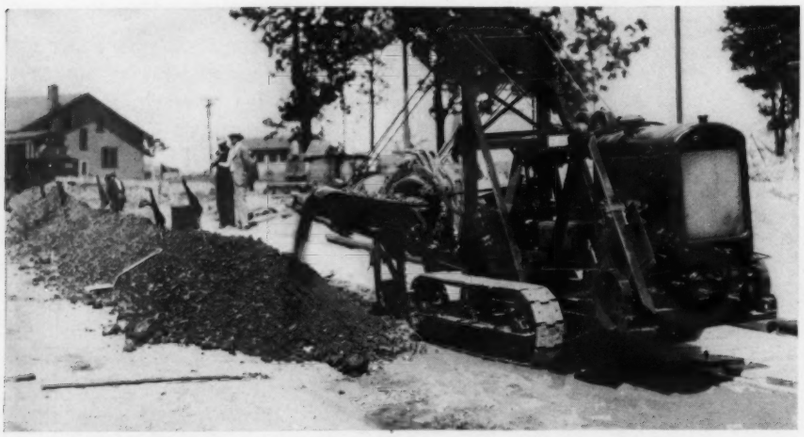
The TAPPAN STOVE COMPANY, Mansfield, Ohio

Pioneers in building Insulated Gas Ranges

Pacific Coast Office, 665 Howard St., San Francisco

TAPPAN *In-So-Top* GAS RANGE

THE GAS RANGE OF *TOMORROW* IS HERE *TODAY*



Results You Can't Ignore!

Statistics compiled from the experience of 100 Gas Companies, using Baby Diggers, show that these trenchers were usable on 90% of their distribution work and that the average cost was less than 25% of former costs by hand labor.

The Baby Digger, extremely compact and mobile, yet sturdily built and powerful, practically eliminates your expensive hand labor, as it delivers a maximum trench footage, even in the most limited areas and toughest soils. You cannot afford to be without this valuable piece of equipment. Write today for information.

THE CLEVELAND TRENCHER CO., 20100 St. Clair Ave., Cleveland, Ohio

"Pioneers of the Small Trencher"

Edward R. Bacon Co., 17th at Folsom Street, San Francisco, California, Distributor

THE BABY DIGGER

Stockton

Fire Brick Company

FIRE BRICK, INSULATING BRICK
HIGH TEMPERATURE CEMENT

High Grade Refractories

for

GENERATOR LININGS

CHECKERS

BOILER SETTINGS

OFFICE:
Russ Building,
San Francisco

WORKS:
Stockton,
California

Selling *the* Idea *of* Gas *in the* Antipodes

(*Continued from Page 25*)

organizations contributing to the success of the week.

Sometimes an advertisement is real news. This was the case when "Duratar"—a by-product of the industry—was placed on the market. This tar is used for a variety of purposes, and is manufactured in increasing quantities by the Colonial Gas Assocation. The good qualities of "Duratar" are consistently placed before the public in attractive newspaper displays.

Another by-product of the industry which is receiving its share of advertising in this general program is sulphate of ammonia, for use in the fertilization of orchards and gardens. This subject was kept before the farmer and orchardist by a series of letters written during the winter months of June, July and August, reminding the farmer that the time is coming for the annual application of a fertilizer, and placing before him the features of sulphate of ammonia which make it superior to other commercial products of its type. In addition to the letters, an attratcive pamphlet was distributed, addressed "To Dairyfarmers and Graziers." This pamphlet sets forth in an attractive manner, illustrated with photographs of prosperous farms and grazing lands, the superiority of this by-product of the gas industry.

Nothing has been said herein of the engineering achievements of the Australian gas industry, which form a separate story in themselves. For over a century the gas industry has been building a tradition of service to the public, winning a firm place in the respect of Australians. The publicity program of the Colonial Gas Association, Ltd. as evidenced by the brief glimpse afforded in this article, is calculated to carry that utility's reputation for "Good Public Service" to the four corners of the commonwealth.

GAS-FIRED EQUIPMENT IS SHOWN AT HOTEL MEN'S CONVENTION

At the Pacific Coast Regional convention of the National Hotel and Restaurant Men's Association held at the Hotel Alexandria in Los Angeles, on February 25, 26, and 27, the Southern California Gas Bureau conducted an attractive exhibit. This Bureau is an organization formed by the commercial departments of the Los Angeles Gas and Electric Corporation, the Southern Counties Gas Company and the Southern California Gas Company, to conduct cooperative enterprises of a sales promotion nature.

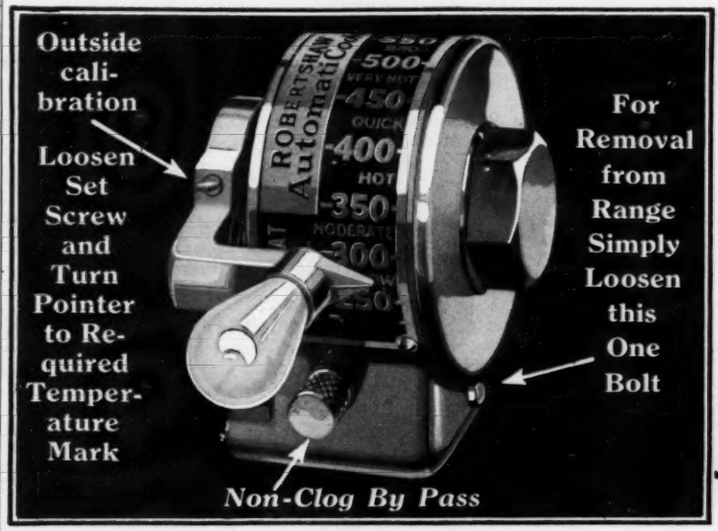
The following gas-fired equipment was displayed in the exhibit: Humphrey Rotisserie, Johnson thermostatic control coffee urn burner; Savory radiant toasters; Roberts portable bake oven; Vulcan hotel ranges; Pitman economy fryers; the Ko-Ray ranges; Topper automatic coffee brewing machine.

E. N. WATKINS ELECTED SEC'Y. OF ARKANSAS NATURAL

E. N. Watkins, formerly general auditor of the Arkansas Natural Gas Corporation of Shreveport, has been elected secretary of the Corporation to replace Joseph Zeppa who has accepted a position as vice-president of the MacMillan Petroleum Company of Los Angeles.

Mr. Watkins has been with the Empire Companies since 1921, coming to the Arkansas Natural as assistant treasurer in March, 1928, following the merger of the Natural Gas & Fuel Corporation with that company.

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

GAS or WATER Connections

whether screw thread or gasket, should be made up with KEY SPECIAL PIPE JOINT COMPOUND.

KEY SPECIAL PIPE JOINT COMPOUND is not a quick hardening cement, but a plastic lubricant and a filler that will seal the most obstinate joint with ease. It covers more surface than an equal volume of red or white lead, thereby reducing the cost. It is waterproof—and there is no waste.

Manufactured by

E. A. Key Co., Inc.

1431 Santa Fe Ave.
Los Angeles, Calif.

Distributors in all principal cities.

WRITE FOR FREE SAMPLE

OSCAR H. FOGG WILL ADDRESS OKLA. UTILITIES CONVENTION

Among the men of national prominence in the public utility industry who have accepted places on the general program of the 11th annual convention of the Oklahoma Utilities Association to be held in Oklahoma City. March 12-14, are Oscar H. Fogg, New York, president, American Gas Association; F. B. MacKinnon, Chicago, president, United States Independent Telephone Association; Martin J. Insull, Chicago, president, Middle West Utilities Company; Labert St. Clair, New York, advertising manager, American Electric Railway Association; Halford Erickson, Chicago, vice-president, Byllesby Engineering & Management Corporation and J. B. Wooton, Chicago, editor, Public Service Magazine. President L. W. Scherer of the Association states that this year's convention is expected to be the largest in the history of the Association.

GAS HOLDER AT VANCOUVER, B. C., WILL BE LAND-MARK

Officials of the gas department of the British Columbia Electric Railway Company, state that the new holder at Vancouver, which is now being completed for the firm, will be utilized for a land-mark for the guidance of air-craft to the permanent Vancouver landing station when completed. The holder will rise to a height of 240 feet, towering above Georgia Viaduct, and will rank as one of the highest structures in the city. It will have a diameter of 140 feet. The company proposes by arrangement with the airport authorities to paint the top of the holder with an arrow showing the direction of the landing field. At night an illuminated arrow will be shown and this sign will be so large that it will be apparent to airmen for a radius of several miles.

McEVERLAST, INC., TO BUILD PLANT AT DALLAS, TEX.

McEverlast Inc., of Los Angeles, California, has announced through the southwestern branch office of the company, located at Dallas, Texas, the immediate construction of a factory in Dallas which will serve 15 states in the southwest with McEverlast products.

A three acre tract has been purchased for the factory from the Missouri-Kansas-Texas Railway alongside the company's track on Maple Avenue. The plant will cost approximately $75,000, and will be ready for occupation by April 1, according to D. T. Mason, Southwestern manager of the Company.

FRANK F. ADLAM IS NOW WITH BELCHIC & LASKEY, INC.

Frank F. Adlam, formerly in charge of main line inspection for the Lone Star Gas Company, has resigned his position to become associated with Belchic & Laskey Inc., of Shreveport, Louisiana. Mr. Adlam, who has been associated with the Lone Star company for the past 12 years, will have charge of the Texas properties for Belchic & Laskey. This company recently purchased the Southwest Gas Company, serving a number of Texas and Oklahoma towns.

LARAMIE GAS CO. SOLD TO OMAHA INTERESTS

Announcement is made of the sale of the Laramie Gas Company of Laramie, Wyoming, to the firm of Smith, Landeryou and Company of Omaha, Nebraska. The new owners have appointed Ward W. Husted, formerly of St. Joseph, Missouri, president and general manager of the local company. Robert B. Martin will serve as secretary and treasurer.

SO. OREGON GAS CORP. HOLDS DISTRICT CONVENTION

Opening of the new branch office and plant of the Southern Oregon Gas Corporation in Grants Pass, Oregon, was the incentive for a district convention held in that city on February 15. The convention was attended by employees of the corporation in Ashland, Grants Pass, Roseburg and Medford.

The new offices at Grants Pass, which formerly housed the post office, have been entirely remodeled. A new front, floors, ceiling and walls, together with attractive interior decoration, give it the appearance of being a new building.

Members of the company attending the opening were entertained with a turkey dinner at the Redwoods Hotel, at which occasion J. W. Whipple, Grants Pass manager, officiated as host.

PUEBLO, COLO., GAS SALES SHOW 300 PER CENT GAIN IN JAN.

Gas sales of the Pueblo Gas and Fuel Company for January show a 300 per cent increase of the corresponding month in 1928, according to figures released by the company on February 3.

In January, 1928, the company sold 10,329,000 cu. ft. of gas as compared with 30,616,000 cu. ft. for January, 1929. This increase is 35 per cent in excess of the company's budget for natural gas operations.

Nearly 500 homes are now being heated entirely by natural gas. Nearly 95 per cent of these are automatically controlled, company officials stated.

WESTERN GAS CO. BUYS RIGHT OF WAY FROM BISON WELLS

Western Gas Company, holder of gas franchises in Ellinwood, Great Bend, Hoisington and other central and western Kansas towns, is purchasing a right of way for a gas line to extend from the gas field at Bison, Kansas, to these points, according to report. It is also stated that the contract for the line has been let to the K. W. Pipe Line Construction Company of Kansas City. About 100 miles of pipe will be laid, 35 miles of which will be 6¼-inch and the remainder of smaller size.

ROOTS COMPANY ISSUES NEW BULLETIN ON ROTARY PUMPS

The P. H. & F. M. Roots Company, of Connersville, Indiana, has just issued a new 16-page bulletin, Number 33-B1, on high pressure type rotary gas pumps. The bulletin give tabulated data on pressures, capacities and horsepowers, a brief review of various types of pumping units, and a comprehensive two-page construction drawing showing the typical unit in detail. The bulletin is so constructed to make it an addition to the large Roots Catalog covering pumps, meters and blowers.

COOKING SCHOOL AT PARSONS, KAN., IS SUCCESS

The United Public Service Company, cooperating with the The Parsons Daily Sun, conducted a successful cooking school in Parsons, Kansas, during the first week in February. A No. 29 Humphrey Radiantfire heater was given as a prize, and a gas range was sold at auction to the highest bidder of the cooking class.

SO. CAL. GAS CO. ASKS PERMIT TO SERVE KINGS COUNTY

Southern California Gas Company has applied to the California Railroad Commission for permission to exercise a franchise for the distribution of gas in Kings County.

LAS CRUCES, N. M., MAY HAVE NATURAL GAS

El Paso Gas Utilities Company is reported to be investigating the probable gas market at Las Cruces New Mexico, with a view to extending the El Paso line, now under construction to that point.

Press reports state that the city council of Las Cruces has granted a 90 day franchise to the utility pending the investigation to determine the returns from the anticipated gas line.

CONRAD, MONTANA, TO HAVE GAS FROM NEARBY FIELD

Conrad, Montana, will be served with natural gas by early summer, according to a decision reached recently between representatives of the production and distribution companies and M. S. Darling, city engineer of Conrad.

The six-inch pipeline will draw upon an available supply of gas from the Kevin-Sunburst field in the vicinity and will be sufficient for the city's needs for an indefinite time.

CARBON COMPANY LAYING LINE TO OUACHITA PARISH PLANT

United Carbon Company has started construction of a 10¾-inch gas line between Ouachita and Union Parishes in the Monroe gas field. The lateral lines will be 8⅝ inches in diameter. The line, which is being constructed to link the company's Union Parish wells with the carbon black plant in Ouachita Parish, as well as to increase the company's supply for pipe line purposes, will be constructed at a cost of approximately $75,000. It is expected to be completed by April 1.

CONNOR AND SON CONST. CO. SECURES KANSAS CONTRACT

Conner & Son Construction Company of Kansas City has been given the contract for the construction of the Missouri-Kansas Pipe Line Company's gas line into Independence, Missouri, from the shale gas fields near Kansas City. The line which will be eight inches in diameter will be begun at once, according to announcement.

The Jackson County Light, Heat & Power Company will distribute gas at Independence. pendence.

TWO GAS COMPANIES SECURE CHARTERS IN KANSAS

General Gas Company and the United Gas and Pipeline Company of Abilene, Kansas, were granted charters by the Kansas state charter board recently. Both companies will operate in central Kansas. according to press reports. The General Gas Company was capitalized at $100,000 and the United Company at $250,000.

RUSSELVILLE, ARK., GIVES PERMIT TO PUBLIC UTILITIES CO.

Russellville, Arkansas, has granted a gas franchise to the Public Utilities Corporation of Arkansas, and will be served with natural gas from the Clarksville-Little Rock line. Plummerville, Conway and other towns along this line have also granted franchises, the latter town already being served with gas from the line.

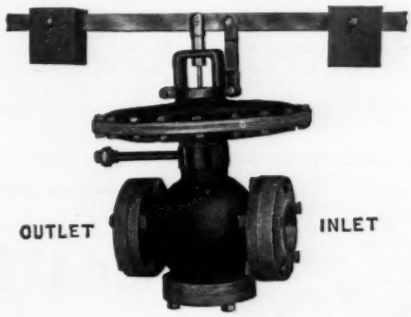
ASHDOWN, ARK., VOTES FOR NATURAL GAS

Ashdown, Arkansas, has granted a franchise for the service of natural gas to that town to the Public Utilities Corporation of Arkansas.

For District or Individual Service—
The Fulton Weighted Illuminating Regulator

It is designed to reduce a medium pressure of 15 pounds or less to any given delivery pressure between one ounce and five pounds.

This is but one of the valves described in our catalog. Sent on request.



The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all Sizes From 1 Inch to 24 Inches; For All Service. 1 oz. up to 1,600 lbs. Pressure to Square Inch.

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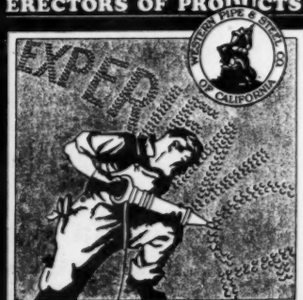

Investigate WESTERN Hi-Pressure Unit Gas Holders

WESTERN PIPE & STEEL COMPANY OF CALIFORNIA

5717 Santa Fe Ave. LOS ANGELES — 444 Market Street SAN FRANCISCO

FACTORIES: LOS ANGELES · SOUTH SAN FRANCISCO · FRESNO · PHOENIX · TAFT

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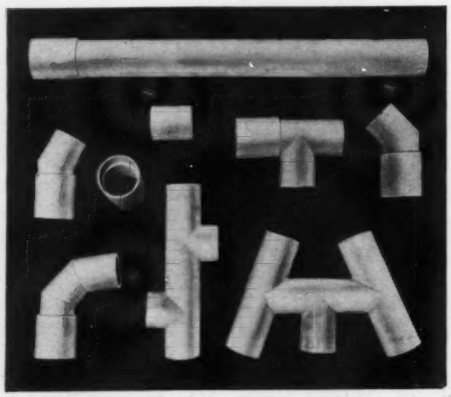
VITEX

Increases Draft

Improves Combustion



Absolutely Non-Corrosive

The Perfect Gas Vent and Flue Pipe

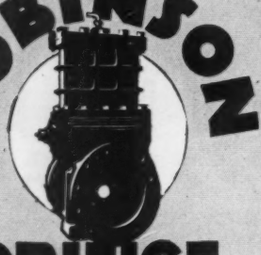
Samples, prices, and installation information gladly furnished on request

Manufactured by

Plant Rubber & Asbestos Works

537 Brannan Street, San Francisco, Cal.

ROBINSON ORIFICE FITTINGS



They eliminate old style by-pass
They save materials
They save time
They save labor
Changing plates is simplified
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Frequent inspection is possible
Occupy little space
Make for better metering
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Cannot leak, etc.

ROBINSON ORIFICE FITTING COMPANY
1435 SANTA FE AVENUE
LOS ANGELES, CALIF., U.S.A.

California Oxide

GAS Purification Requirements can be most efficiently cared for through the additional and improved facilities of our new plant in Southgate.

Both Maas and McKee Oxides have met gas purification requirements of the Pacific Coast over a period of several years and merit your investigation.

California Oxide Co.
308 East Eighth Street
Los Angeles
TRinity 0769

POCATELLO, IDAHO, COMPANY REPORTS 1928 ACTIVITY

Nearly $11,000 were spent in additions to the gas system of the Public Utilities Consolidated Corporation at Pocatello, Idaho, of which W. W. Flanders is district manager. Gas sales for the year totaled 32,845 M.c.f., and 118 new independent meters were installed. Gas appliance merchandising was active during the year, the company selling 125 ranges, 125 water heaters, 21 space heaters, 18 conversion burners and 4 gas fired refrigerators. The company has appropriated $10,000 for the 1929 program of expansion.

THREE COMPANIES MERGE IN COMMERCIAL OIL & GAS CO.

The Linn Pipe Line Company, the Commercial Pipe Line Company and the Commerce Gas Company, operating in Linn, Burton and Allen Counties, Kansas, have formed a fourth company—the Commercial Oil & Gas Company into which the others have merged, according to report. The stock of the three companies was controlled by the same stockholders. T. S. Salathiel is head of the merged companies.

APACHE GAS CO. BUYS OKLAHOMA DISTRIBUTION SYSTEMS

Gas distribution systems at Perry and Lovell, Oklahoma have been purchased by the Apache Gas Company, according to press reports, from the Perry Service Company and the Earl W. Baker Utilities Company, owners of the properties. The Apache Company of which S. M. Williams Jr., of Tulsa, Oklahoma, is president, expects to supply gas from the Logan county fields.

PUBLIC SERVICE CO. PLANS TO SERVE MORE TOWNS

Plans for serving several towns in northern Colorado with natural gas were announced recently by the Public Service Company of Colorado. The natural gas line from Amarillo into Denver will probably be extended to give the supply, and the following towns would be benefited: Boulder, Berthoud, Loveland, Longmont, Lafayette, Lyons, Broomfield, and Ft. Collins.

WM. F. RABER NAMED PRES. OF CIVIC ORGANIZATION

Wm. F. Raber, vice-president and general manager of the San Diego Consolidated Gas and Electric Company, has been elected president of the San Diego-California Club for the year 1929. The club is a subsidiary of the San Diego Chamber of Commerce, its chief function being the handling of the advertising-publicity work of the chamber.

CITIES SERVICE BUYS 4,000 ACRES IN PANHANDLE

Cities Service Gas Company, an Empire subsidiary, recently purchased the oil and gas rights on approximately 4,000 acres of land in Carson County, Texas. The purchase includes a producing gas well. Construction work to connect the well to the company's main line system is now completed, and the line is ready for government tests.

CONSUMERS GAS CO. ASKS PERMIT TO SELL STOCK

Consumers Gas Company has applied to the State Railroad Commission for authority to sell $100,000 of common capital stock. The company was organized to supply gas to the city of Paso Robles in San Luis Obispo County.

WACO MAY HAVE NATURAL GAS FROM BROWN COUNTY

A pipeline costing approximately $2,000,000 is in project by the Brown County Gas Company, with headquarters at Brownwood, Texas, according to recent reports. It is the plan of the company to organize a subsidiary to construct the natural gas line from the Brown and Coleman County gas fields to Waco, Texas.

CITIES SERVICE GETS PERMIT FOR INDUSTRIAL LINE

The Missouri Public Service Commission granted a permit to the Cities Service Gas Company for the construction of a natural gas pipeline from Newton County to the Ashgrove Lime and Portland Cement Company's plant near Springfield, Mo. The line will cost approximately $1,200,000.

ATHLETIC LEAGUE OF NEW ORLEANS CO. ELECTS OFFICERS

The board of governors of the New Orleans Public Service Athletic League, has named the following officers for the ensuing year: O. J. Legendre, president; E. N. Avegno, vice-president; Warren Land, secretary; Jos. Licciardi, treasurer; and Frank Durr, engineering superintendent.

GAS USED IN CONSTRUCTION OF U.S.S. "CHICAGO"

Gas from the lines of the Pacific Gas and Electric Company is the fuel being used in riveting in the construction of the U.S.S. "Chicago," now under way at the Mare Island Navy Yard in San Francisco. An honorary riveting gang drove the first rivets in the ceremony of laying the keel.

P. G. AND E. BUYS CAPITAL STOCK OF OAKDALE GAS CO.

Pacific Gas and Electric Company has been granted permission by the California Railroad Commission to purchase the outstanding capital stock of the Oakdale Gas Company, operating in the towns of Oakdale and Riverbank, California.

BARBARA OIL & GAS CO. SOLD TO WINCHESTER OIL & GAS CO.

Announcement has been made that the Winchester Oil and Gas Company has purchased the gas properties of the Barbara Oil Company in Barber County, Kansas, making gas available for distribution in Alva and other towns in that vicinity of northwestern Oklahoma.

C. & G. COOPER CO. HAS NEW LOS ANGELES OFFICES

The C. & G. Cooper Company of Mt. Vernon, Ohio, announces that the Los Angeles offices of the company, together with the warehouse, are now located at 630 E. 61st Street. J. W. Reed is Pacific Coast manager for the company.

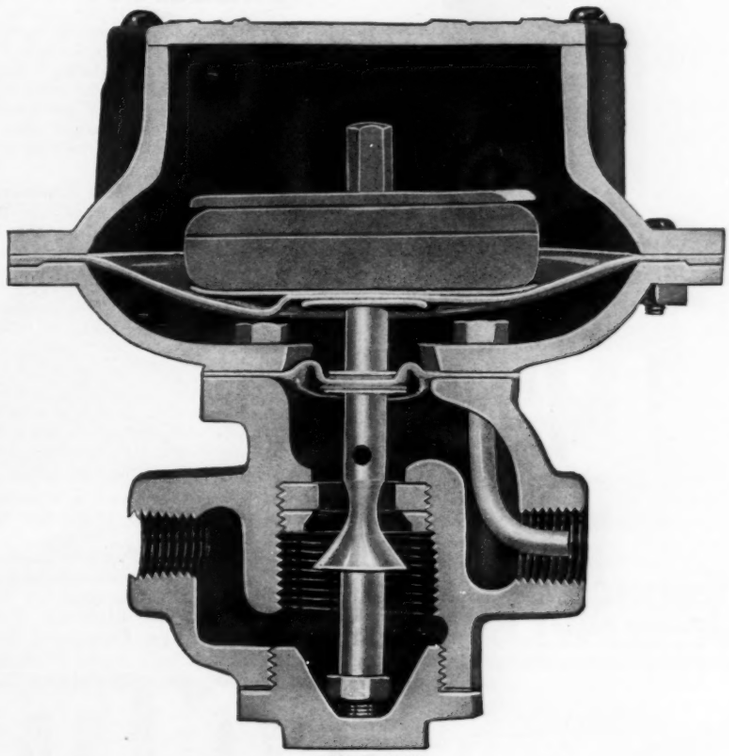
FEB. 9 SHOWS 332,806 M.C.F. SOLD IN LOS ANGELES BASIN

The day of peak demand for gas for the past winter in the Los Angeles Basin occurred on February 9. The reported send-out on this date was 332,806 M.c.f., and marks a new high point in gas sales in that area.

WORK STARTED ON LA JUNTA, COLO. PIPELINE

Southwestern Construction Company has opened offices in La Junta, Colorado, and work on the pipeline which will bring gas to that city, Rocky Ford and Swink will be started immediately.

Reliance Low Pressure or Appliance Regulator



TYPE "A"

This type of regulator is designed for use directly on a gas supply to the appliance or for governing entire house supply up to the limits of inlet pressure and capacity.

Remarkable for its ability to maintain pressures under great demand. Capacity 50% to 100% greater than any other regulator on the market.

Built in sizes 3/8", 1/2", 3/4", and 1".

Reliance Manufacturing Company

ALHAMBRA, CALIFORNIA

For Reliability—*Specify*

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GAS INDUSTRY

Pneumatic Equipment

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NEW YORK CITY · LOS ANGELES · SAN FRANCISCO
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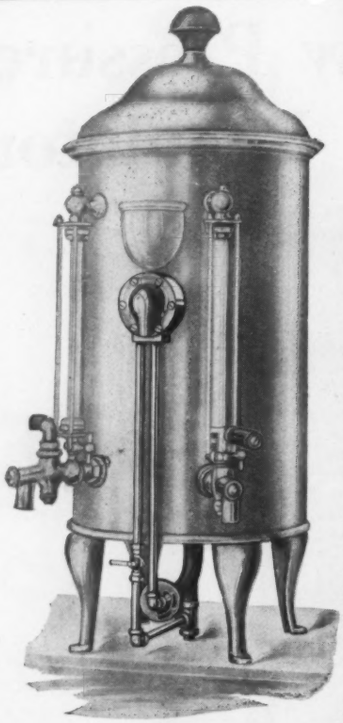
Offices in principal cities the world over



Take Advantage of this New and Profitable Market!

A fertile market has been thrown open by the advent of the Johnson Thermostatic Heat Control for coffee urns and steam tables. Restaurants and cafeterias everywhere are quickly recognizing this device as being a valuable adjunct to the economical and efficient operation of their coffee urns and steam tables.

The Johnson Thermostatic Heat Control has been subjected to exhaustive tests and widespread use. It is absolutely fool-proof. May be quickly and easily attached to any urn or steam table. The results of its use are so obvious and valuable, that restaurant and cafeteria managers proclaim it as being one of the most needed inventions of recent times.

Further economy in gas consumption may be effected through the use of the new-type Urn Burner. This burner sets near the bottom of urn or table with the result that maximum flame heat is utilized. Also quickly and easily attached to any urn or table.

We would be pleased to send a descriptive folder to you. You should know the facts! Write today!

JOHNSON GAS APPLIANCE Co.
Cedar Rapids IOWA

Pacific Coast Representative:
C. B. Babcock Co.
135 Bluxome Street
San Francisco, Calif.

PATENTED

Martin Unit Gas Furnaces

ARE THE RESULT OF 38 YEARS HEATING EXPERIENCE
MADE IN FOUR SIZES
Electric, Thermostat or Manual Control
Approved by A. G. A. Laboratory and by the City of Los Angeles
Write for your copy of "Modern Heating Methods"

PHILLIPS HEATING, VENTILATING & MFG. CO.
1710 W. Washington St.
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Live Agents Wanted

TESTING LABORATORY A.G.A. APPROVED

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

Natural Gas *Is* Remaking *the* South

(*Continued from Page 23*)

storage plants, paper mills, bottling works, bakeries, oil refining, meat packing, distilled water, oil well tool manufacturing, welding processes, candy making, flour mills, city water works, chemical industry, foundries, cooperage plants, broom factories, coffee roasting, engraving, food products, steel mills, ice cream cone factory and paint manufacturing. Texas also uses more gas for generating electricity than any other state in the union.

REVAMPING RATES

The development of proper rate schedules and the abolition of archaic percentage contracts have been a great relief to the industry and have enabled it to go forward as never before. It was perhaps those restraints which were the chief reasons for placing the old Kansas Natural Gas Company in receivership. Proper principles of rate making, scientific study of leakage, and consideration of the load factor are constructive steps which have been of great aid in the expansion above outlined. There have been many consolidations and mergers recently in the Southwest, not all of which have been so financed as to reflect credit on those companies which are soundly financed. In such a rapid development it is but natural that some financing practices should be deemed better than others. This is a matter to which stable companies should give close attention.

Cases where the gas supply is inadequate or the market is too competitive, or the public is already well supplied, or the management is untrained or the engineering unsound, or the financial structure weak or unfair to the investor or public, should be driven into the open so that the investor may be able to act with the full facts before him. We should strive for a corporate soundness that will stand the adversities of bad years and still be equipped with resources that will maintain satisfactory service.

Pipe line interconnection has been growing with the growth of the industry and these interconnections are aiding with increased effectiveness to offset local failures. The natural gas industry can well emulate the electric industry in the matter of widespread interconnection.

Knowing the fate of a prophet in his own country, I do not have the temerity to predict the future of our industry. As an indication of the future I point to what has happened recently. Within the past year Texas has come up from fourth to second place in production, with an increase of 45 per cent; Louisiana has surpassed the pioneer state of West Virginia; Oklahoma still tops the list of producing states, and the center of production has moved from the East to the Southwest. Broad vision, hard work, sound financing, and good public relations will give the industry a bright future and maintain it in its present position as one of the leading constructive industries of the country.

FLAGSTAFF, ARIZ., GAS COMPANY IS REORGANIZED

Flagstaff, Arizona will have gas by August 1, according to an announcement by C. B. Wilson, vice-president of the Flagstaff Gas Company. Plans for the company's plant include a 50,000 cu. ft. gas holder, a 10,000 cu. ft. relief holder, and other modern equipment.

Leon Melekov has resigned as president of the company, and is succeeded by E. W. Wilson of San Francisco, California.

WILLIAM C. GRANT JOINS LONE STAR GAS COMPANY STAFF

William C. Grant, director of the Texas Public Service Information Bureau at Dallas, Texas, resigned that position February 15th, to accept a position with the Lone Star Gas Company where he will be engaged in public relations work for that company and its subsidiaries.

Wm. C. Grant

Mr. Grant succeeded the late George McQuaid as director of the Texas bureau and has held that post since June 1, 1927. He is also secretary of the Southwest Division, Natural Gas Department, American Gas Association.

The Lone Star Gas Company operates approximately 3,000 miles of main pipe line, supplying gas to more than 200 cities and towns in Texas and Oklahoma.

KANSAS CITY GAS CO. TROUBADORS ADOPT "NATIONAL AIR"

The "Troubadours," eleven piece orchestra of the Kansas City Gas Company have adopted the following song as their "National Air."

KEEP THE GAS FIRES BURNING
(Tune: "Keep the Home Fires Burning")

Keep the Gas fires burning,
And omit that yearning,
When the Oil tanks stop up,
And the Coal runs low,
You will have no ash pile—
But you'll see the cash pile,
With the warmth and comfort
Of the folks at HOME.

The song was written by Paul Stolz of the commercial department of the company. director of the orchestra.

ADDISON B. DAY PRESENTED "DIPLOMA OF GOOD WILL"

At the 17th annual banquet of the Old Guard of the Los Angeles Gas and Electric Corporation, held on February 13, at the Biltmore Hotel, a beautifully bound and illuminated "Diploma of Good-Will" was presented to Addison B. Day, fellow Guardsman, and president of the corporation. The "Diploma" was designed in book form, bound in hand-tooled blue morocco leather. Handmade paper was used in the body of the book. The gift represents the individual and collective sentiment of the Old Guard, and was presented by William Maddock, chairman of the committee which had previously placed the matter before the organization for approval.

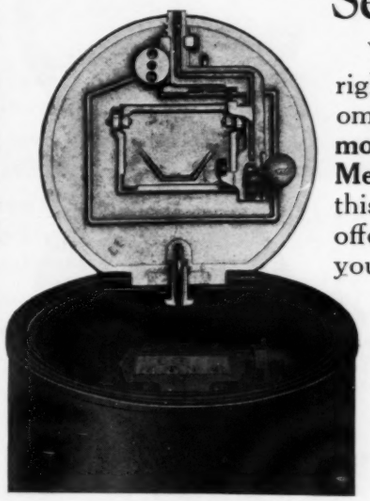
CUTLER-HAMMER, INC., PURCHASES TRUMBULL VANDERPOEL MFG. CO.

Cutler-Hammer, Inc., of Milwaukee, Wisconsin, announces that the company has acquired the business of the Trumbull Vanderpoel Electric Manufacturing Company, of Bantam Conn., which will be operated as a subsidiary under its present name. This purchase will add a complete line of meter service and safety switches to the present Cutler-Hammer line of motor control wiring devices and allied electrical items.

J. P. STEELE IS DISTRICT SALES MGR. OF S. CHESTER TUBE CO.

The South Chester Tube Company has appointed J. P. Steele as district sales manager in the Southwestern territory, with headquarters in the Petroleum Building at Fort Worth.

Under-ground Gravity Locked All Cast-Iron Meter Box Sent You FREE



You are stepping on your own rights—Yes, you are pushing "Economy" **down** — You are spending, **monthly,** unnecessary **dollars** for **Meter-Reading** if you are not using this box—and for these reasons we offer you free one of these boxes for your personal use—Wire or write.

The Leading Companies in the Southwest Specify this Box Because . . . . . .

Those leading companies who have used this box **continue the use because** it means economy and safety. Won't you save as they have saved? Will you profit by their experiments? Ask the Lone Star Gas Company, Community Natural Gas Company, Oklahoma Natural Gas Company for their opinions on our locked or unlocked boxes.

Cost of Box Is Nominal

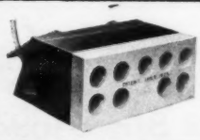
RIVER CLAMPS, FLANGES; in fact, a complete line of **Gray Iron Castings** makes it possible for us to manufacture this **all cast-iron, gravity-locked, underground meter box** at a very low price. Your inquiry should be mailed today. You should personally examine this box. You should see it. Read your meter through a meter **reading door.**

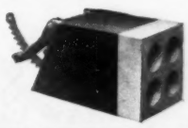
We Also Make the Castings for The Webster Engineering Company.

Tulsa—Okla.—Sandsprings

Patents—Patented and Pending

Tulsa Stove & Foundry Co.





Mettler Entrained Combustion Gas Burners

FOR ALL Purposes
Kinds of gas
Pressures

406 S. Main St. LEE B. METTLER, CO. Los Angeles Cal.

EMPIRE
Oil Meters

Positive Displacement
Oscillating Piston Type

Simple in Construction—Easy to Operate—Low in Cost of Maintenance

EMPIRE meters are highly accurate, and **stay** accurate. They are invaluable for cracking and absorption processes; for gas companies; for refiners and distributors of gasoline and all distillates of petroleum; for measurement of crude oil, cold or hot.

ALL SIZES ⅝" TO 6"

Standard meters will withstand working pressures of 150 lbs. to the square inch. High pressure types will handle 300 lbs. Higher pressures and special types to order.

National Meter Company

299 Broadway, New York

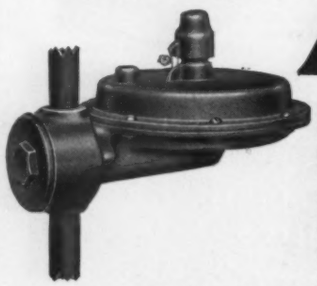
1048 Folsom Street, San Francisco **645 Santa Fe Avenue, Los Angeles**

Lower rates, natural gas extensions, improvements in service, and aggressive sales plans under way by most of our Western utilities are providing new weapons, unlimited ammunition to the gas industry. The barriers of solid fuel are crumbling away. Lucky the salesman on the firing line today with the opportunity to travel fast and far in this great movement.

C. B. Babcock Co.

San Francisco **Los Angeles**

MODEL 10 SERIES
With or Without Mercury Seal



Spring Type
Also furnished in Dead Weight Type

Reynolds
Gas Control Since 1892

Products for all kinds of Pressure Reduction—for either artificial or natural gas.

GOVERNORS — Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic Quick Closing Anti Vacuum.

REYNOLDS GAS REGULATOR COMPANY
Anderson, Indiana

CONTRACTS LET BY P. G. AND E. FOR TWO GAS HOLDERS

Contracts have just been awarded by the Pacific Gas and Electric Company, for the two large holders to be constructed in connection with the big natural gas project which is now under way.

The Bartlett-Hayward Co., Baltimore, Md., are building the 8,000,000 ft. holder in the Oakland plant. The foundation work will be done by the Pacific Gas and Electric Company in the case of the Oakland holder and the 10,000,000 cubic feet water-seal holder to be constructed at the Potrero San Francisco plant.

These two new constructions will increase the holder capacity of San Francisco to 32,370,000 feet and that of Oakland to 27,214,000 feet.

"PAYNE PILOT" IS NAME OF NEW HOUSE ORGAN

Payne Furnace & Supply Company, Inc., of Beverly Hills, California, is now issuing a regular bulletin, "Payne Pilot," which keeps the reader well informed on what is happening in the world of furnace installation. In the February issue there are articles by E. L. Payne, vice-president and general manager of the company; by R. W. Campbell, general sales manager; and by Bert Scott, heating and ventilating engineer.

DISTRIBUTION CONFERENCE OF A. G. A. TO MEET IN BOSTON

The annual Distribution Conference of the Technical Section of the American Gas Association will be held at the Copley Plaza Hotel in Boston, Mass., on April 3, 4, and 5. Details of the program are in the hands of F. M. Goodwin of the Consolidated Gas Company of Boston, chairman of the Distribution Committee, and H. W. Hartman, assistant manager of the American Gas Association.

T. G. ARROWSMITH HAS AGENCY FOR BIRMINGHAM STOVE CO.

T. G. Arrowsmith, president of the San Francisco company bearing his name, has recently returned from a three weeks' trip to eastern manufacturing centers.

While in Birmingham, Alabama, he closed an agreement to represent on the Pacific Coast the Birmingham Stove and Range Company's line of domestic and industrial gas stoves and ranges.

M. & M. PIPE LINE CO. LAYING PECOS-TO-PYOTE LINE

The M. & M. Pipe Line Company, holder of a gas franchise in Pecos, Texas, is constructing a gas line 5½ inches in diameter, from Pecos to Pyote where it connects with a line from gas wells in the Winkler, Texas, field. The line will be 27 miles in length and is expected to be completed around February 1. The natural gas distribution system in Pecos will cost approximately $250,000.

DON C. RAY IS ELECTED PRESIDENT OF EQUIPMENT ASS'N

Don C. Ray, manager of the Public Relations Bureau of the Pacific Gas and Electric Company of San Francisco, was elected president of the Western Irrigation Equipment Association at the recent annual meeting of that body held in Los Angeles.

E. H. PANN ACCEPTS POST WITH ENG. RESEARCH & EQUIP. CO.

E. H. Pann, formerly gas engineer for the Pan-American Petroleum Company, Los Angeles, is now associated with the Engineering Research & Equipment Company of the same city, in the capacity of sales engineer.

Incomparably Efficient

INCOMPARABLY efficient operation, greater economy and convenience — surplus water heating quality built into a new and radically improved water heater — this is the new Rex-Patrol. To heat water easily, quickly, economically, and clean, to provide an ample supply and to eliminate hot water shortage and inconvenience.

For many years Rex engineers have labored to solve this problem. They planned, they built, they tested. They destroyed and built again until they were satisfied and convinced that

Rex-Patrol
Water Heaters

do give "Carefree Hot Water Service."

Automatic Water Heaters not so long ago were only within reach of those people who could afford to excel in something different. The Rex-Patrol, however, is priced so low that it is within reach of everyone.

Thousands of dollars were spent in designing and building this great home convenience, this maintainer and preserver of health, this helper of cleanliness, this eliminator of laborious tasks.

We suggest that you do not delay any longer to get complete data and selling plans of this household necessity. Every day that you put it off, every week, every month you are losing money.

We invite you to send for the Rex Partnership Plan for Gas Companies.

The Cleveland Heater Co.
1900 West 112th St. Cleveland, Ohio

"Keep the Home Laundry Fires Burning"

RIGHT now hundreds of progressive gas companies are aggressively merchandising Lamneck Laundry Dryers—to clubs, schools, hospitals and apartment houses, as well as individual homes.

They realize the vast potential of a low-cost, thermostatically controlled dryer. They know the Lamneck **permanently** solves washday's biggest problem by drying all the clothes **perfectly**—on every washday, and they know that with a Lamneck in the laundry room the washing will always be done at home—indirectly boosting the load of washer, ironer and water heater.

The LAMNECK LAUNDRY DRYER

is a **new,** not a replacement appliance. It fills the gap between washer and ironer. It **does not** require larger mains or meters—and there's **no servicing** after installation.

The Lamneck is nationally advertised. It has thermostatic temperature control—indirect heating and stainless metal hanging rods equal to 60 ft. of clothes line.

We'll be glad to give you details about our attractive dealer proposition.

THE W. E. LAMNECK COMPANY
443 Dublin Avenue,
Columbus Ohio

The W. E. Lamneck Company,
443 Dublin Ave., Columbus, Ohio
Please send details about your dryer proposition.

Name .....
Company .....
Address .....
.....

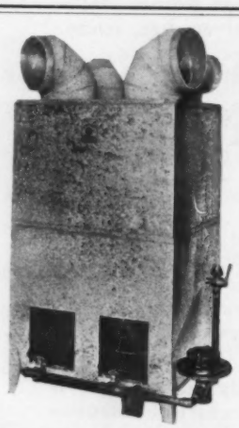
Gladding, McBean & Co.

FIRE BRICK

Manufacturers of a Full Line of High Grade
REFRACTORIES
For Boiler Settings, Industrial Furnaces, Dutch Ovens, Etc.

SHAPE WORK A SPECIALTY
Also Fire Clay Chimney Pipe, Chimney Tops,
Flue Linings, Gas Flues.

Los Angeles 621 So. Hope St. TRinity 5761 | Oakland 22nd and Market Oakland 0262 | Fresno (San Joaquin Materials Co.) | San Francisco 445 Ninth St. Douglas 0540



Furnace Service

How much of your overhead is represented by unnecessary trips to your job?

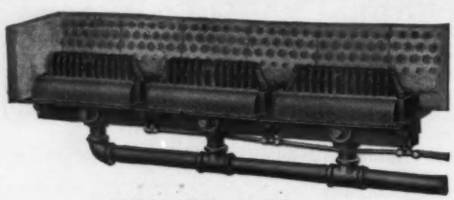
In other words does your furnace or your service man render your service?

Install **Perfection Multiple Unit Furnaces** and cut down on your overhead.

L. H. Freymuth Jr

311 East Pico St., Los Angeles

R. M. C. Gas Burner



700° More Heat
ROTARY MANUFACTURING CO.
5720 Long Beach Avenue Los Angeles, California

SOUTHERN GAS CO. COMPLETES COMPRESSOR STATION

Southern Gas Company, a subsidiary of the Moody-Seagraves interests, has recently completed a compressor station at San Antonio, Texas, for boosting gas to Seguin, New Braunfels and Austin. The company is also constructing a 10-inch loop line, 12 miles in length between Three Rivers and San Antonio which will increase the capacity of the line by 7,000,000 cubic feet per day.

CENTRAL STATES P. & L. LAYING GAS LINE TO CARTER, OKLA.

Central States Power & Light Corp., distributor of gas at Elk City, Oklahoma, is constructing a six-inch gas transmission line from that city to Carter, Okla. The company is also planning changes and improvements in its Elk City distribution system, to be made during the next few months, according to announcement.

B. C. GAS DEPT. HAS ORDER FOR 21 RADIATORS IN PLANT

Twenty-one radiators will be installed by the gas department of the British Columbia Electric Railway Company in the new cold storage plant under construction at New Westminster, B. C. These radiators will be part of a vacuum gas heating system which is being installed at a cost of $3,250 to heat offices and compressor rooms.

VERNON O. MURRAY IS NAMED REPRESENTATIVE OF SAFETY CO.

The Mine Safety Appliances Company, of Pittsburgh, Pa., announces the appointment of Vernon O. Murray as district representative with headquarters at Salt Lake City, Utah. Mr. Murray has had experience in mine rescue work and safety service, with the United States Bureau of Mines, and was stationed at Reno, Nevada.

CARROL MOUCK NAMED MGR. OF UNION PUBLIC SERVICE CO.

Carrol Mouck has been appointed manager of the Union Public Service Company, a Doherty holding, at Beggs, Oklahoma, replacing J. B. Powell who has been transferred to the engineering department of the Doherty Company at Kansas City. Mr. Mouck was formerly superintendent of the Miami County Pipe Line at Paola, Kansas.

PROSSER, WASH., GRANTS NATURAL FRANCHISE TO R. E. COMBS

R. E. Combs, representing eastern capital, has secured the franchise for the service of gas to the city of Prosser, Washington. The company is authorized to begin construction within six months on a line from the Benton County natural gas wells to the city of Prosser.

MR. AND MRS. J. E. DAVIES IN CALIF. FOR THE WINTER

J. E. Davies, general manager of The Peoples' Gas Stores, Inc., merchandising arm of The Peoples Gas Light and Coke Company of Chicago, Illinois, with Mrs. Davies, is spending the winter in California for the second successive year. Mr. and Mrs. Davies are making their temporary home in Pasadena.

NATURAL GAS TO HEAT OFFICES AT MINNEQUA PLANT

Natural gas furnaces for heating office buildings at the Minnequa plant of the Colorado Fuel & Iron Company are being installed. The plant formerly used steam from the blast furnaces.

HILL, HUBBELL & COMPANY OPENS CHICAGO OFFICE

Hill, Hubbell & Company, division of the General Paint Corporation, is opening an office, March 10, in Chicago, Illinois, to be located in the Banker's Building.

The office will be in charge of Edgar S. Browning, vice-president and general manager, Eastern Division of Hill Hubbell & Company, and general manager, Eastern Division of the General Paint Corporation.

This office is being opened to accommodate increased business in connection with the pipe coating and wrapping plants of the company, which are now located in the following mills: Youngstown Sheet & Tube Company, Indiana Harbor, Indiana; National Tube Company, Lorain, Ohio; Youngstown Sheet & Tube Company, Youngstown, Ohio; A. O. Smith Corporation, Milwaukee, Wisconsin; Central Tube Company, Economy, Pennsylvania; Spang, Chalfant Company, Ambridge, Pennsylvania.

LEWISTON, IDAHO, WILL HAVE NEW GAS PLANT

Construction will begin in April on a new gas plant at Lewiston, Idaho, according to a recent announcement made by Thomas L. Cross, Lewiston manager for the Northwest Cities Gas Company. The plant will have about double the capacity of the present one, and will cost approximately $100,000, being designed to serve about 20,000 consumers.

COAST COUNTIES MAKE LARGE APPROPRIATION FOR 1929

Coast Counties Gas Company has appropriated $485,300 for improvements and betterments to the system during 1929.

Watsonville district system will be improved to the amount of $157,000; Santa Cruz, $93,300; Hollister, $91,000; Contra Costa, $73,000; and Gilroy, $72,000.

SO. CAL. GAS CO. REDUCES RATES IN TWO COUNTIES

Southern California Gas Company announces a 10 per cent reduction in its rates for domestic and commercial service in San Bernardino and Riverside counties, California. The new rates are expected to result in a saving to consumers of approximately $143,000 per year.

A. R. SOULECK, OF SO. CALIFORNIA GAS COMPANY, DIES

Announcement is made of the death, late in January of A. R. Souleck, assistant treasurer of the Southern California Gas Company for the past seven years. Mr. Souleck was stricken with a heart attack while playing golf on the Fox Hills golf course.

JOHNSON GAS APPLIANCE CO. ELECTS OFFICERS

The Johnson Gas Appliance Company of Cedar Rapids, Iowa, at a recent annual meeting, elected the following officers for the coming year: W. G. Haskell, Jr., president and secretary; George T. Hodges, vice-president; and W. N. Dearborn, treasurer.

SIGNAL HILL OIL CO. WANTS TO SERVE LEWISTOWN ,MONT.

Franchise for the service of natural gas to Lewistown, Montana, has been asked by the Signal Hill Oil Company. The company has offered to defray the expenses of a special election to decide the matter.

Dehydration

in its simplest form

Diagrammatic top view

THE PIONEER SEPARATOR

without a moving part, accomplishes the complete separation of liquids from gas or other vapors.

PIONEER EQUIPMENT CORPORATION
OF AMERICA

231 BROADWAY NEW YORK

California Representative
H. PLUMMER
806 Fife Building
San Francisco, California

Fire Brick Contractors

Established 1906

J. T. Thorpe & Son
Inc.

Specializing in Gas Generator, Boiler, Still and Furnace Brick, Industrial Furnaces, Retorts, Kilns, Brick Smokestacks.

A capable Engineering Department competent to advise on any problem involving firebrick construction.

San Francisco	Seattle	Portland	Los Angeles
417 Market St.	305 White Bldg.	609 Ry. Exch. Bldg.	321 W. 3rd St.

HOT-N-KOLD

The Hot-N-Kold Shops are now serving the public in eight cities in the northern part of California with Kelvinator Refrigeration, Holbrook Ranges, Welsbach Water Heaters, and other major appliances.

A valuable business franchise awaits the right dealer in every town.

HOT-N-KOLD CORPORATION

949 Mission Street **San Francisco, California**

GILFILLAN
Dual Control Valve Regulators

Write for literature

SAVE ONE INSTALLATION

Maintain a constant steam pressure on the boiler
and
Reduce and maintain an unvarying gas pressure to the burner regardless of the variation in line pressure.

Built to control Boiler pressure from one pound to 200 pounds steam, and deliver as low as two ounces gas pressure at the burner.

GILFILLAN MACHINE WORKS, Inc.
Ebenezer, Erie Co., N. Y.

Representatives
Jensen Instrument Co., 624 E. Fourth St., Los Angeles, Calif.
Gas Appliance Service Corp, 2014 Bryan St., Dallas, Texas.
The Diamond Supply Co., Charleston, W. Va.

The Magic Way Company

Gas Heating Devices

including

"Magic Way" Gas Furnaces
"Magic Way" Control Valves and Switches
"Potter" Radiators
"Steel Made" Radiators
"Cole" Floor and Wall Heaters
"Hall" Floor Furnaces

Manufactured by

Magic Way Company
National City San Diego California

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge.

HELP WANTED—MALE

Wanted: Salesman with car for established gas heating business in Los Angeles. State age, experience and references. Salary to begin, $200.00 month. Average earning is more than double this amount. State qualifications fully. Address, P. O. Box 895, Station C, Los Angeles.

Wanted—Several Domestic, Househeating and Industrial salesmen on properties in Utah, Idaho, Montana, and Colorado. Address L. H. Stratford, P. O. Box 268, Pocatello, Idaho.

SITUATIONS WANTED—MALE

Young married man having several years experience in gas utility merchandising and manufacturer's representation, who is especially qualified in handling men and promoting sales campaigns, desires new business position with utility. Best references. Address, B-20, care of *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

REFRIGERATOR EXHIBIT FEATURE OF ORANGE SHOW

As an appropriate display at the Nineteenth National Orange Show which opened on February 14 in San Bernardino, California, the Southern California Gas Company placed a full line of gas refrigerators on exhibit. Designed and executed by J. E. Kern, refrigeration engineer of the company, the booth proved immensely popular with all visitors to the show.

BYLLESBY ENGINEERS TO HOLD FOURTH ANNUAL CONVENTION

The fourth annual convention of the engineering department of the Byllesby Engineering & Management Corporation will be held March 19-22, as announced by H. W. Fuller, vice-president in charge of engineering and construction.

MINE SAFETY APPLIANCES CO. ISSUES CATALOGUE

"Everything for Mine and Industrial Safety," is the title of the third edition of Catalogue No. 3, issued by the Mine Safety Appliances Company, with headquarters in Pittsburg, Pa. The brochure describes and illustrates all types of mine safety appliances and first aid supplies.

W. B. JENNINGS OF HOPE ENGR. CO. IN L. A.

W. B Jennings, in charge of engineering and sales for the Hope Engineering Company of Mount Vernon, Ohio, was in Los Angeles recently, accompanied by A. R. Thomas, Pacific coast manager of the company, which maintains offices at 1031 South Broadway, Los Angeles.

Burrell All Service Gas Mask

M-S-A Combination Hose Mask

Announcing A Complete Safety Service for the Pacific Coast Trade

The Mine Safety Appliances Company of Pittsburgh, Pa., announces the opening of a Pacific Coast Branch at 318 East Third Street, Los Angeles, California, where a complete stock of established M-S-A Products is carried to serve the western gas and oil trade.

A Complete Line of Gas Protecting, Detecting and Resuscitating Equipment

M-S-A Safety Equipment includes such well-known products as the Burrell All Service Gas Mask, the only mask that will protect against all poisonous gases; the M-S-A Combination Hose Mask, for entering and working in confined spaces where high concentrations of gas or oxygen deficiencies exist; the H-H Inhalator for resuscitating victims of gas poisoning; the Carbon Monoxide Detector, First Aid Materials, etc., etc.

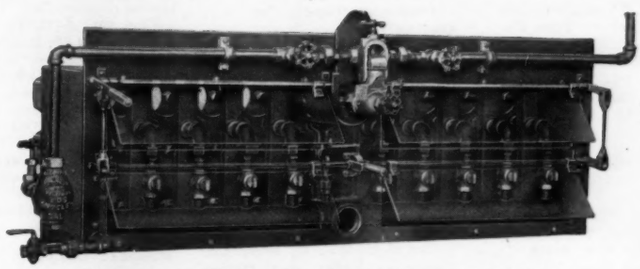
We Welcome the Opportunity to Serve You!

Mine Safety Appliances Co.

Braddock, Thomas and Meade, Pittsburgh, Pa.

"Everything for Mine and Industrial Safety"

Leahy Oil and Gas Burners



View showing Leahy Combination Gas and Oil Unit

Gas Burners Designed and Built

for

Horizontal, Front, Rear, and Vertical Firing

using

Low or High Pressure Natural or Manufactured Gas

and

Oil Burners—Mechanical, Steam, and Air Atomizing

To obtain maximum efficiencies and capacities on all makes of high and low pressure steam boilers, stills, kilns, retorts, industrial furnaces, water heaters, bake ovens, kettles, etc.

consult

Leahy Manufacturing Co.

1804-1810 East Eighth Street *Established 1902* **Los Angeles, Calif.**

A WESTERN GUIDE to INDUSTRIAL PURCHASING

Readers interested in any articles not listed in these pages are cordially invited to advise *Western Gas* of their wants and every effort will be made to furnish a list of the proper manufacturers. Addresses of companies listed on these pages may be found by consulting their advertisements in this issue.

Absorption and Compression Plant Equipment
Baker Iron Works.
Chaplin-Fulton Mfg. Co.
Jensen Instrument Co.
The E. A. Key Company
Western Pipe & Steel Co.

Absorption Towers
Baker Iron Works.
Western Pipe & Steel Co.

Adjustable Plugs
Western Pipe & Steel Co.

Agitators
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Aluminum Bronze Powder for Paint
Hill, Hubbell & Co.

Analyzers
Fort Worth Laboratories.
Smith-Emery Co.

Apparatus, Experimental Gas
The Bartlett Hayward Co.
Pacific Meter Works.

Appraisals and Valuations
Charles R. Collins.
Smith-Emery Co.
United Engineers & Constructors, Inc.

Bags, Gas Main
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Barometers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Westcott & Greis, Inc.

Bench Iron Work
The Bartlett Hayward Co.
General Gas Light Co.

Blocks and Tiles, Fire Clay
Gladding, McBean & Co.
Stockton Fire Brick Co.

Blowers and Boosters
Ingersoll-Rand Co.
Connersville Blower Co.
The P. H. & F. M. Roots Co.
United Engineers & Constructors, Inc.

Boiler Controls
The Cleveland Heater Co.
Gilfillan Machine Works, Inc.

Boiler—Brickwork
J. T. Thorpe & Son, Inc.

Boiler Equipment
E. A. Key Co.

Boiler Maker's Tools
E. A. Key Co.

Boilers, Gas-Fired
American Radiator Co.
C. B. Babcock Co.
Baker Iron Works.
Leahy Mfg. Co.

Boiler Settings, Pipe and Boiler Insulation
J. T. Thorpe & Son, Inc.

Boilers, Waste Heat
Baker Iron Works.
The Bartlett Hayward Co.
Phillips Heating, Ventilating & Mfg. Co.
United Engineers & Constructors, Inc.

Boilers, Water Tube
Baker Iron Works.
Western Pipe & Steel Co.

Breakers
Ingersoll-Rand Co.

Breeching (Boiler and Stack)
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Brick, Firebrick
Gladding, McBean & Co.
Stockton Fire Brick Co.
United Engineers & Constructors, Inc.

Brick, Firebrick—Installation
J. T. Thorpe & Son, Inc.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Buildings, Steel
Baker Iron Works.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Bunkers, Steel and Concrete
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Burners, High Pressure
Leahy Mfg. Co.
Lee B. Mettler.
Rotary Manufacturing Co.

Burners, Low Pressure
C. B. Babcock Co.
The Bartlett Hayward Co.
Duro Gas Burner Company.
L. H. Freymuth
General Gas Light Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Lee B. Mettler.
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
Rotary Manufacturing Co.
Western Pipe & Steel Co.

Burners—Oil
Leahy Mfg. Co.
Rotary Manufacturing Co.

By-Product Recovery Apparatus
The Bartlett Hayward Co.

Calorimeter Accessories
Fort Worth Laboratories.
Pacific Meter Works.
United Engineers & Constructors, Inc.

Cases, Meter
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Casinghead, Gas Meters
The Bristol Company
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.

Casing and Tubing (steel)
South Chester Tube Co.

Casing—Iron
South Chester Tube Company

Cast Iron Pipe
United States Cast Iron Pipe and Foundry Co.

Castings
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Cement
Stockton Fire Brick Co.

Cement, High Temperature
Stockton Fire Brick Co.

Centrifugal Pipe
United States Cast Iron Pipe and Foundry Co.

Charging Machines (retort, etc.)
The Bartlett Hayward Co.

Checker Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chemical and Gas Testing Apparatus
Fort Worth Laboratories.
Pacific Meter Works.
Stauffer Chemical Co.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Chemists, Analytical
Fort Worth Laboratories.
Smith-Emery Co.

Chimneys, Radial Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chimneys, Radial Brick Installation
J. T. Thorpe & Son, Inc.

Chutes (coal, coke, ash)
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Clamps and Sleeves, Pipe
S. R. Dresser Mfg. Co.
Mueller Co.

Clamps, Service
Mueller Co.

Cleaners, Service
C. B. Babcock Co.
Pacific Meter Works.

Coal Gas Plants
Charles R. Collins.
The Bartlett Hayward Co.

Cocks
C. B. Babcock Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Merco Nordstrom Valve Co.
Mueller Co.
Geo. D. Roper Corporation.

Collectors, Dust
Western Pipe & Steel Co.

Compressors, Air
Ingersoll-Rand Co.
Leahy Mfg. Co.

Compressors, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, High Pressure
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, Portable
Ingersoll-Rand Co.

Condensers
Baker Iron Works.
The Bartlett Hayward Co.
Ingersoll-Rand Co.

Condenser Boxes
Baker Iron Works.

Controllers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
The Foxboro Co., Inc.
Robertshaw Thermostat Co.

Controls, Air and Steam
The Bartlett Hayward Co.
The Bristol Company
The Foxboro Co., Inc.
Jensen Instrument Co.

Cooling Systems
The Bartlett Hayward Co.

Cooling Towers
J. B. Gill Corporation.

Counters, Revolution
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.

Couplings
S. R. Dresser Mfg. Co.
The Bartlett Hayward Co.

Couplings—Flexible Rope & Spider Arm
The P. H. & F. M. Roots Co.

Coverings (Flat and Corrugated)
L. H. Freymuth

Cubic Foot Bottle
Pacific Meter Works.

Cutters, Pavement
Ingersoll-Rand Co.

Cylinders, Compressors
The C. & G. Cooper Co.

Danger Signals
Safety Gas Main Stopper Co.

Dephlegmaters
Western Pipe & Steel Co.

Diaphragms, Meter
Chaplin-Fulton Mfg. Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Diggers, Clay
Ingersoll-Rand Co.

Discharging Machines (retort, etc.)
The Bartlett Hayward Co.

Door, Clean-out
Baker Iron Works.

Drills
Ingersoll-Rand Co.
Mueller Co.

Drill Pipe—Iron
South Chester Tube Company

Drill Pipe—Steel
South Chester Tube Company

Dryers—Laundry
W. E. Lamneck Co.

Elevators
Baker Iron Works.

Engineers and Engineering Service
Charles R. Collins.
J. B. Gill Corporation.
The Bartlett Hayward Co.
Smith-Emery Co.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Engines, Diesel
The C. & G. Cooper Co.

Engines, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.
United Engineers & Constructors, Inc.

Engines, Oil
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Steam
Ingersoll-Rand Co.

Evaporating Apparatus
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Excavators, Ditch and Trench
The Cleveland Trencher Co.

Exchangers, Heat
Baker Iron Works.
Western Pipe & Steel Co.

Exhausters
Connersville Blower Co.
Ingersoll-Rand Co.
United Engineers & Constructors, Inc.
United States Cast Iron Pipe and Foundry Co.
The P. H. & F. M. Roots Co.

Experimental Apparatus
The Bartlett Hayward Co.
Pacific Meter Works.

Filters
United States Cast Iron Pipe and Foundry Co.

Fire Clay and Products
Gladding, McBean & Co.
Stockton Fire Brick Co.

Fire Brick Contractors
J. T. Thorpe & Son, Inc.
Stockton Fire Brick Co.

Fittings
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Fixtures, Lighting (Domes, Portables, etc.)
C. B. Babcock Co.
Welsbach Company.

Fire Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Flanges
Pittsburgh Equitable Meter Co
Westcott & Greis, Inc.

Forgings
Baker Iron Works.
Payne Furnace & Supply Co.
Geo. D. Roper Corporation.
J. T. Thorpe & Son, Inc.

Furnaces, Floor
Electrogas Furnace Co.
Magic Way Company
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.

Furnaces, Heating
The Estate Stove Co.
L. H. Freymuth
Payne Furnace & Supply Co.
Magic Way Company.
Pacific Gas Radiator Co.
Phillips Heating, Ventilating & Mfg. Co.

Furnaces, Industrial
C. B. Babcock Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Mueller Co.
Payne Furnace & Supply Co.

Gas Analysis Apparatus
The Foxboro Co., Inc.
Fort Worth Laboratories.
Jensen Instrument Co.
Pacific Meter Works.
United Engineers & Constructors, Inc.

Gas Masks
Safety Gas Main Stopper Co.

Gas Main Tapping & Drilling Machines
Mueller Co.

Gaskets
The E. A. Key Company
Pittsburgh Equitable Meter Co
Safety Gas Main Stopper Co.
Southwestern Pipe Joint and Engineering Co.

Gasket Compound
E. A. Key Co.

Gas Pipe Line Construction
Western Pipe & Steel Co.

Gates—Wind & Blast
The P. H. & F. M. Roots Co.

Gauges
The Bristol Company
Fort Worth Laboratories.
The Foxboro Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Westcott & Gries, Inc.

Gauges, Steam
The Bristol Company
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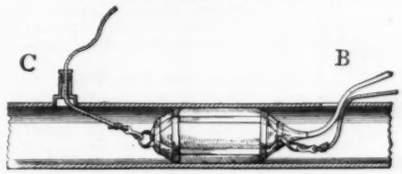

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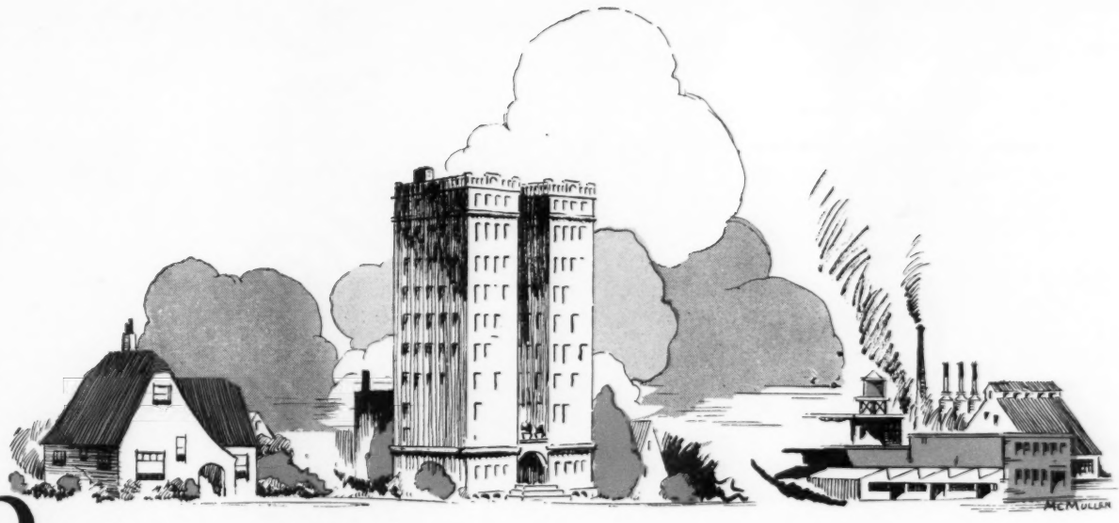

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